CHARLESTON AS A COAL PORT. *See p.* 129.
OWNERS AND SHIPBUILDING FACILITIES. *See p.* 124.

SHIPBUILDING AND SHIPPING RECORD

A JOURNAL OF SHIPBUILDING, MARINE ENGINEERING, DOCKS, HARBOURS AND SHIPPING

LONDON: Queen Anne's Chambers, S.W. 1.
GLASGOW: 87, Union Street.
NEWCASTLE: Lloyds Bank Chambers.

THURSDAY, AUGUST 9, 1917.

Price Sixpence Weekly.
Prepaid Subscription for 12 months:—
Inland, £1 5s. 0d.; Abroad, £1 12s. 0d.

The DELTA METAL Co., Ltd., East Greenwich, London, S.E.
Sole Manufacturers of:—
DELTA METALS
Forgings, Castings, Stampings, Rods, Sheets, Wire, Tubes, Etc.
BRONZE, BRASS, COPPER, NAVAL BRASS, YELLOW METAL, WHITE BRASS; BABBITS, Etc.
FOREMOST since 1883.

THE YORKSHIRE COPPER WORKS, LTD., LEEDS.
TUBES BRASS and COPPER.
"BEMAL" BRASS CONDENSER TUBES.

THE "STONE" SYSTEM of HYDRAULICALLY OPERATED WATERTIGHT DOORS.
AS FITTED TO LATEST MAIL AND PASSENGER STEAMERS.
J. Stone & Co., Ltd.
Deptford, LONDON, S.E.

ROBT BOWRAN & Co., LTD., Newcastle-upon-Tyne.
MARINE METALS
"WHITE" BRONZE, "MARINE" BRONZE.

EXTRUDED METALS
Brass and Bronze Rods for Turning, Forging and Stamping.
GUNMETAL INGOTS.
McKECHNIE BROTHERS, LTD.,
Brass Rod Manufacturers,
ROTTON PARK STREET, BIRMINGHAM.

JOHN I. THORNYCROFT & Co., Limited.
SHIPBUILDERS & ENGINEERS
MARINE MOTORS & MOTOR BOATS.
CAXTON HOUSE : WESTMINSTER : LONDON, S.W.
ALL TYPES OF STEAM, COMMERCIAL and PLEASURE CRAFT.

THE SUNDERLAND FORGE & ENGINEERING Co., LTD.,
SUNDERLAND.
ELECTRIC LIGHT & POWER FOR SHIPS. - - ELECTRIC WINCHES.

ELECTRICAL INSTALLATIONS ON STEAMSHIPS. - - - -
W. C. MARTIN & CO.,
10, West Campbell Street, Glasgow.
Telegrams: "MOTIVE," Glasgow.
Contractors for Cunard R.M.S. "AQUITANIA."

BILLINGTON & NEWTON, LTD
TRADE MARK
PHOSPHOR BRONZE.
BABBITT'S, KINGSTON'S AND MAGNOLIA

TRADE MARK
TIN AND COPPER
NAMO. PLASTIC
ANTIFRICTION METALS
LONGPORT STAFFORDSHIRE

BROWNS STEERING GEARS

Steam, Hydraulic and Electro-Hydraulic

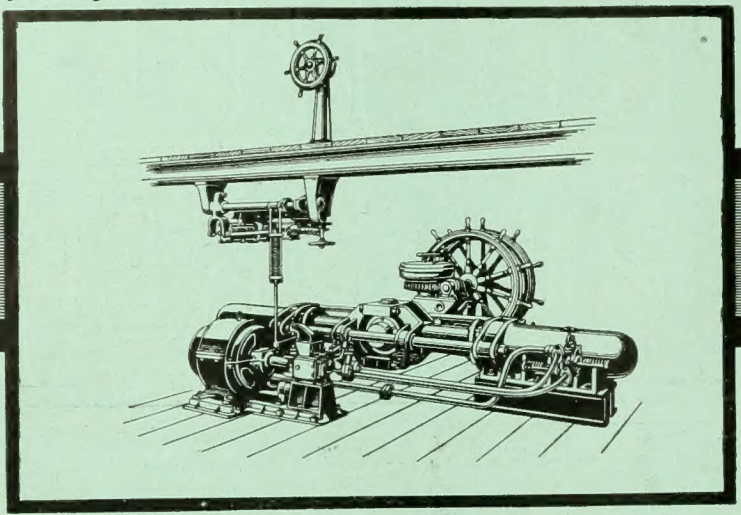
IRON FOUNDERS

Telegrams:
HYDRAULIC
CODE
A·B·C·

TELEMOTORS
FOR
STEERING & HELM SIGNALS

DIRECT ACTING REVERSING
& TURBINE CONTROL ENGINES

COMPLETE INSTALLATIONS
OF HYDRAULIC CARGO
WORKING GEAR FOR SHIPS



Williams—Janney Brown Electro-Hydraulic Steering Gear With Hand Gear Combined.

"SILENT & ECONOMICAL."

BRASS FOUNDERS

Telephones:
CENTRAL
8931-2
CODE
A·B·C·

WILLIAMS—JANNEY BROWN
ELECTRO-HYDRAULIC
STEERING GEARS.
BOAT HOISTS, CRANES,
WINCHES, ETC. ....

Under Licence from
The Variable Speed Gear, Ltd.,
London, S.W.

BROWN BROTHERS & Co., LTD.,
ROSEBANK IRON WORKS
EDINBURGH

Liverpool Office
LIONEL TAYLOR & CO.
Royal Liver Buildings.

Newcastle Office:
H. K. DENTON & CO.
Prudential Buildings.

THE POWER PLANT CO LD.
WEST DRAYTON MIDDLESEX.

SINGLE AND DOUBLE REDUCTION
GEARS FOR TURBINE SHIP DRIVES
for any power.

MICHELL THRUST BEARINGS.
TURBO BOILER FEED PUMPS.

Telegrams: "ROC, WEST DRAYTON." Telephone: 22 YIEWSLEY.

SHIPBUILDING AND SHIPPING RECORD
A JOURNAL OF SHIPBUILDING, MARINE ENGINEERING, DOCKS, HARBOURS AND SHIPPING

Published Every Thursday at
QUEEN ANNE'S CHAMBERS, WESTMINSTER, LONDON, S.W. 1.
Branch Offices—
Glasgow: 87, Union Street. Newcastle: Lloyd's Bank Chambers.
New York: Woolworth Building.

Telegraphic Address: "Recordship, Vic., London."
Telephone No.: 2247 Victoria.

Subscription, including regular weekly and special issues, published from time to time, payable in advance and postage free:—
British Isles..... £1 5s. 0d.
Elsewhere..... £1 12s. 0d.
Single Copies..... Sixpence.

The Editors will be glad to consider articles and paragraphs submitted by competent writers. All accepted contributions will be paid for. Whilst every care will be taken to return unsuitable articles, photographs and drawings (when a stamped addressed envelope is enclosed for that purpose) the Editors cannot hold themselves responsible for the safekeeping of unsolicited contributions.

Vol. X.] Thursday, August 9, 1917. [No. 6.

CONTENTS.

EDITORIALS:
Shipping Losses and Excess Profits Duty..... 121
Mid-Scotland Ship Canal..... 121
An Unusual Claim Dispute..... 121
Three Years of War Insurance..... 121
Shipping Freights..... 122
Port Improvement Schemes..... 122
North African Trade..... 122
The German Reconstruction Bill 122
Shipbuilding Contracts..... 122
Australian Shipbuilding..... 123
Liner Construction..... 123
Shipbuilding in Canada..... 123
The Value of Armour..... 123
The Standard Oil Engine..... 123
Merchant Shipping and the War 124
Owners and Shipbuilding Facilities..... 124
Superheated Steam..... 125
Publications Received..... 126

ILLUSTRATED:
Charleston as a Coal Port..... 129
The Simpson-Gordon Patent Bilge Tunnel..... 131

MISCELLANEOUS:
Government Use of Business Men 126
Obligations Imposed Upon Shipping..... 127
Norwegian Developments..... 128
German Views on U-Boat Losses 128
Keels and Shallow Draughts..... 130
The Development of Machinery in the U.S. Navy during the Past Ten Years..... 132

GENERAL NEWS SECTION..... 135

SHIP SALES..... 143

SHARE TABLE..... 144

PROFITS are sometimes extremely difficult to ascertain for taxation purposes. A case noted in the report of the British Steamship Owners' Association throws light on the relation of excess profits duty to the amount recovered under various policies on a vessel lost in December, 1915. This sum came to £11,250 in all. The amount recovered on hull and machinery was £7,200, and the rest was derived from policies of other descriptions such as policies on outfit and disbursements. The Inland Revenue claimed that this sum, roughly £4,000, became liable to excess profits duty. The owners vigorously maintained that it did not represent actual profits at all, but that these additional policies were in fact intended to cover *pro tanto* the balance of the uninsured risk on hull and machinery. A settlement substantially embodying this contention was arrived at when the case came before the Inland Revenue Commissioners, under which the sum claimed as liable to excess profits duty was reduced from £4,000 to £863. Recognition is thus given to the principle admirably expressed in the words of the report that "where the amount covered by the hull and machinery policy is less than the amount at risk, and policies of other descriptions are taken out for sums substantially in excess of the actual sums at risk under these descriptions, then the excess on the latter policies must be regarded as having been taken out with a view to covering *pro tanto* the balance of the uninsured risk on hull and machinery."

Ship Losses and Excess Profits Duty.

Within the past few months a renewed interest has sprung up in the project to construct a Mid-Scotland ship canal to connect the Clyde and the Forth. There are two rival routes, each with its partizans anxious to obtain the ear and the support of the Admiralty. One, known as the Loch Lomond route, is the longer. It would open on the Clyde a considerable distance below Glasgow, and that prospect is little relished by the Corporation of that alert business city. It has consistently advocated the construction of a ship canal by what is known as the Direct Route. Its western terminus would be in the vicinity of Glasgow, and it would tap the industrial district of Mid-Scotland. Many of the commercial and engineering considerations involved in the two schemes were investigated some years ago by the Royal Commission on Canals and Waterways, but no specific scheme was adopted. The widespread interest which the question excited at the time fell rather into abeyance, although some outstanding advocates of a waterway for ocean-going vessels across Scotland have never ceased to urge its construction. Now the idea has got abroad that the Admiralty is giving serious consideration to the matter. This has revived the activity of the partizans of the rival routes, and from time to time questions in the House of Commons show anxiety that the plans and merits of both routes should be fully in the minds of the authorities.

Mid-Scotland Ship Canal.

It is not often that underwriters enter into controversy with owners on a matter of structural detail; in fact, the technical knowledge of the average underwriter with regard to shipbuilding is of so limited a nature as to prohibit any discussion of design or equipment, except of a most elementary character. It is therefore the more surprising that, in the case of a recent casualty, underwriters have raised a point of this nature. The case is one of heavy weather damage, which the underwriters contend resulted from weakness of the parts affected. The owners, being of the opinion that the damage was the result of heavy weather, and nothing else, naturally resisted the underwriters' contention. Expert opinion, after survey, has been quoted by both sides, and, as usual in such cases, the advocates of each opinion are equally confident of the correctness of their diagnosis. Of course, the question is, which side is to pay for the repairs made necessary by the damage. Heavy weather damage in the ordinary way is undoubtedly the underwriters' affair, while damage resultant from structural weakness must be paid for by the owner. The case is not yet settled, and it is probable that arbitration will be called upon to decide the dispute. Whichever way the verdict goes, however, the interest of the matter remains in the fact that the underwriters have taken their stand on a very unusual point, and are pitting their somewhat limited experience, backed by a certain amount of expert advice, against the opinion of those whose entire business life has been concerned with the building and management of steamers.

An Unusual Claim Dispute.

The conclusion of a third year of war affords a fitting opportunity for reviewing the manner in which the marine insurance market has met the difficulties with which it has been beset during the troublesome period which has elapsed since August, 1914. It will be remembered that insurance alone was faced with the necessity of carrying on business without a halt. Other businesses were able to suspend operations and watch which way the trend of affairs was conducting them. Bank holidays enabled the financial situation to be reviewed and adjusted. The buying and selling of goods could be made subject to various alternatives, but insurance of goods and vessels on the seas had to be carried on without respite. It will not be forgotten in what manner the market responded to the call made on it. Hesitations there were, and gloomy opinions were not without

Three Years of War Insurance.

their advocates, but the market, as a whole, responded to the enormous increase of responsibility with which it was saddled. Nor from that day has it ever looked back. It is impossible to attempt to estimate the increase of liability which has fallen on the market owing to the war. Apart from war risk premiums, the increase in values both of ships and commodities has eventuated in underwriters accepting and running lines which in peace time they would have considered excessive in the extreme. The increase of risk has been commensurate with other increases, and it must not be thought that because premiums have increased beyond all expectations that an equal accretion of profits has resulted. In the Hull market, for example, it is probable that not one underwriter has reached the figures of his net profit of the year which ended on December 31, 1913.

Shipping Freights.

Shipowners have been charged with making big profits out of freights, and thus to a large extent being responsible for the high cost of commodities. It is interesting to learn on the confession of the Parliamentary Secretary to the Ministry of Shipping (Sir Leo Chiozza Money) that the Government are at least as guilty as are the private shipping companies. In answer to a question addressed to him by Sir Walter Runciman as to the cost of carriage of wheat and flour from America, Sir L. Chiozza Money stated that the charge to the Wheat Commission is the actual cost of carriage based upon the appropriate Blue Book rates of hire. Asked further whether the freights charged for the carriage of bacon, cheese, butter and similar articles of food carried in requisitioned ships are the freights which are paid to the shipowners or whether they are the competitive rates which are entered on the bills of lading and for what reason the English consumer is charged these high freights, the answer was that Blue Book rates were charged for commodities the supplies of which are controlled, and market rates where supplies are uncontrolled, and that in the latter case the profit goes to the Treasury. It will be no satisfaction to the public to know that the profit made by the Treasury goes to help to defray the cost of the war; it is sufficient for them to realise that the Government have an opportunity of reducing the cost of certain commodities and they refuse to do so. They are thus as guilty as the shipowners whom they so vigorously condemn.

Port Improvement Schemes.

Not only on the Thames, but also at other centres throughout the United Kingdom, the various port authorities concerned have either decided upon, or are now considering, schemes for the increase of shipping facilities, in view of an expected expansion, and probable readjustment, of trade after the war. It is certainly not wise policy to wait for the restoration of peace in order to make preparations of the kind. On several occasions we have made reference to the activities of the Port of London Authority in this connection, and we now hear that plans for Plymouth have been approved in principle by the Admiralty, which will not, however, sanction any work that is likely to interfere with the approaches to it. At Avonmouth, too, where in recent years extensive additions have been made to the docks, more wharves are to be built, chiefly, it is understood, for the benefit of industries that not very long ago were carried on in Germany on a big scale. Even in Ireland, several improvement projects are being discussed and, in order to realise them, it is hoped to obtain financial assistance from the Government. At Limerick, for instance, the Harbour Commissioners propose to link up the docks with the railway system. Apparently, this plan is the result of a recent interview with Sir Joseph Maclay, the Shipping Controller, before whom a detailed statement of facilities and accommodation was laid. Then, again, an outlay of £3,000 has been sanctioned by the Great Southern & Western Railway of Ireland for railway extensions at Dublin, in accordance with suggestions from the Irish Controller of Shipping.

North African Trade.

Reference has been made in these columns of late to the promising openings for maritime enterprise along the South, East, and West African coasts. In the northern part of the Continent, too, important trading developments are now taking place, which later on should have equally good seaborne results. Apart from the improving prospects in Egypt and the Italian colonies, there has, we understand, been a great economic expansion in the French territories during the past three years, and, especially as regards Morocco, splendid roads have been made between all the principal towns, railway routes have been agreed upon, and the ports have also come in for their share of attention. In the past, the backward condition of the harbours, necessitating the loading and discharging of steamers in the open roadstead, and in bad weather their avoidance of them altogether, has militated against progress to such an extent that shipping facilities have been considerably curtailed. The situation has however undergone a change for the better, and it is not therefore surprising to learn that British shipowners are taking steps to provide more efficient services than was the case before the war. In North African waters they are likely to have an opportunity such as they never had before, and it will be unfortunate if they do not take every advantage of it. At all events, German shipping interests should not be allowed to regain their hold on this trade.

The German Reconstruction Bill.

This measure (the full text of which was given recently in our columns) appears to have been given a mixed reception in shipping and political circles in Germany. Even its fate seems to hang in the balance, though *Hansa* speaks bravely of the hopes that the Bill will be passed during the summer session of the Reichstag, and reminds its readers (and legislators) that the Reichstag Commission for Industry and Commerce passed a resolution last month emphasising the vital importance of immediate Government co-operation in rebuilding the German merchant fleet. The Bill in its present form is "a compromise between what the Government is likely to accept and the wishes expressed in conferences between shipowners and Government representatives." *Hansa's* view is clearly that shipowners must be thankful for small mercies, and that whilst the present Bill represents "nothing like complete realisation of the desires expressed by owners after mature consideration," it is, nevertheless, the thin end of the wedge. The Bill deals with some of the most important problems. If it can secure attention now it may be amended favourably during its passage, and in any case it is a good augury for the sort of complete indemnity desired after the war. There appears, however, in *Hansa's* words an underlying uneasiness lest amendments unfavourable to shipping be introduced in the Government programme. It is hardly credible that any responsible person in Germany can entertain seriously the idea of establishing the *status quo* in the German mercantile marine at the ultimate expense of the Allies; and if not so, how then ?

Shipbuilding Contracts.

In pre-war times the fixing of the contract price for large ships was a matter of considerable difficulty and not a little speculation. Mr. Peskett, of the Cunard Company, gave an instance of how tenders varied for a vessel 600 × 72 ft., of the usual Cunard type. The difference between the highest and lowest tender was £100,000, the probable cost of the ship being in the region of from £300,000 to £400,000. Few shipbuilding firms could afford to lose so much in a contract, and fewer shipping concerns care to pay any more than is absolutely necessary for the proper construction of their ship. In the contracting for vessels of great size a large element of speculation enters into the problem. The price of material and labour may vary greatly during construction, and the shipowners' overseers may be exacting to an unnecessary extent. If such difficulties existed

in normal times, the state of shipyard labour at the present moment seems to preclude all notion of fixed prices for large vessels at any rate. The practice which has existed in some establishments of working on a percentage basis will doubtless become much more prevalent. When shipowners and builders alike strive to keep the cost down to a minimum consistent with the best production, the method will work satisfactorily to all parties concerned. It has proved successful in many cases, the essential thing being that a mutual feeling of confidence should exist between owners and builders.

Australian Shipbuilding.

As the result of an agreement between the Commonwealth Government and the trade unions, there is now every reason to anticipate more shipbuilding activity in Australia. Indeed, there is, if we except a more uncertain labour situation, nothing to prevent as much enterprise of the kind there as in Canada, where the industry is showing remarkable signs of expansion. Apparently, however, one of the chief difficulties hitherto has been to keep the skilled men continuously employed, but now that a standard ship construction programme has been definitely decided upon, this obstacle should not, for a time at least, hinder progress. Many years ago shipbuilding flourished in Australia, especially in Tasmania, and a revival of former conditions in that State, as well as in New South Wales, is anticipated with a good deal of satisfaction. According to all accounts, it is intended to give special attention to the building of composite ships, a steel framework filled in with wood, or a compromise between the all-wood and the all-steel vessel. This type of ship is strongly urged at the moment in the United States as a solution of the problem now before the Shipping Board, and, among other advantages, it is claimed that it costs less money and requires a smaller amount of skilled labour than an all-steel vessel of the same size.

Liner Construction.

The enemy's ruthless submarine warfare has probably had a heavier toll from our large liners than from ordinary tramp tonnage. Our maritime superiority depends as much on the former as on the latter, and the ravages of war must be made good. Passenger traffic has been grievously curtailed during hostilities, but when these cease the demand for liners will be more imperative than ever. Few steps are being taken by shipbuilding and shipping firms to prepare for this demand. Several reasons are given for this. Our shipyards are busy with warships of all kinds, and in berths unoccupied by these, purely cargo ships are being constructed. The demand for material for these is as much as the steel works can cope with. Vessels which are not of immediate use receive scant attention. Whilst it is improbable that the construction of liners could be proceeded with at the present time, it must not be overlooked that a deal of preparatory work could be undertaken. The determination of the particulars of design and the preparing of initial plans of large liners take some time, and with the requirements of the bulkheads, boats and davits, and loadline committees, such time will be considerably extended. Shipping companies desiring fresh tonnage should therefore get into touch with the builders, so that the designs of new ships should be ready in order that their immediate construction may be proceeded with when the opportune moment arrives.

Shipbuilding in Canada.

We referred last week in this column to the activities of Colonial and foreign shipyards, and an interesting sidelight is thrown upon the activities of the Canadian shipyards by Sir L. Chiozza Money in answer to a question in Parliament. He stated that all steamers under construction in Canada are being built to the classification of Lloyd's or the British Corporation under the supervision of the surveyors of these societies. The vessels have been allocated to various shipping firms of good standing for management after completion, and those firms have sent out experienced superintendents to watch the progress of the work. The assistance of the Imperial Munitions Board is also available; there is thus no risk of these ships proving unsuitable for general service whether during the war or after. We learn further that the construction of merchant ships in Canada, undertaken on behalf of the British Ministry of Shipping by the Imperial Munitions Board, is divided into two parts, one devoted to the construction of steel merchant ships being under the direction of Mr. W. I. Gear, of the Robert Redford Company, Montreal, whilst the other is devoted to the construction of wooden ships, this section being under the direction of Mr. R. P. Butchart, of Victoria, B.C., assisted by Captain J. W. Troop, manager of the British Columbia Coast Service of the Canadian Pacific Railway Company, the headquarters of this section being at Victoria, B.C. This is the first intimation we have had that the British Government is directly concerned in the problem of constructing wooden ships.

The Value of Armour.

Rear-Admiral Bacon in his paper "The Battleship of the Future," read before the Institution of Naval Architects a few years ago, concluded with these words:—"The whole future is pregnant with radical obliteration of our present notions as regards tactics; but we may confidently prophecy that size of ships and power of gun will increase until war, the great arbitrator among theories, will confirm or reconstitute our opinions regarding naval armaments." When he wrote these words the *Dreadnought*, or her immediate successor, was the largest ship afloat, and since then ships infinitely superior in size and power have been built. His prophecy has certainly been fulfilled in that respect. It is probably too soon to draw conclusions as to the ultimate effect on the design of future warships which the present conflict will have. Meantime, however, two points seem to be clear, viz., that the gun will still be the chief weapon of offence, in spite of the improvement in submarines and torpedoes, and that the question of the thickness and disposition of armour will require reconsideration. The tremendous range at which modern naval engagements are fought renders side armour comparatively useless as the deck of a vessel offers a much greater target to a falling shell than does the relatively small portion of the side which is protected. It is probable therefore that the armour may require a different disposition, or if the same side protection be thought necessary a considerable increase in weight of armour carried will follow, with a corresponding sacrifice of either speed or gun power.

The Standard Oil Engine.

It is only gradually as the result of many years of practical experience, that any one particular type of engine tends to become the standard. Thus at the present day, after more than 75 years spent in developing the steam engine as a means of ship propulsion, just when the triple-expansion vertical engine might be said to represent standard practice for steam ships of average size, we have the application of geared turbines to cargo vessels setting up a new direction in which development can be carried on. The rapid increase in the number of ships driven by oil engines should also in time tend to produce a particular type of oil engine which will represent the standard practice of English builders, and whilst differing, as do triple-expansion steam engines built at the present time, in certain minor details, all oil engines built will conform more or less closely with this standard. Already the tendency towards standardisation is becoming apparent. Thus all engines work upon the Diesel or constant-pressure cycle. Again, whilst the single acting type of engine is almost invariably adopted, trunk pistons have been discarded and rigid piston rods with external crossheads and guide bars represent the usual marine practice at the present time; the engine is usually vertical, and thus in appearance resembles closely the double-acting triple-expansion

steam engine, save that the cylinders are open on the underside. But there is still one very important feature upon which a definite decision has not yet been reached, and that is whether the cycle of operations shall be operated in four piston strokes or in two. There is much to be said in favour of each of these cycles of operation, and when designers are agreed as to which is the better cycle to adopt, no doubt the form of the engine used will gradually assume, in all save the smaller details, a more or less standard form.

MERCHANT SHIPPING AND THE WAR.

AS we stand upon the threshold of the fourth year of the greatest war the world has ever known, it will not be unprofitable to glance back in order that we may recall how those fateful years have affected the British Mercantile Marine and how the men of the Merchant Service have met the terrible ordeal that has been thrust upon them. Of the work of the Navy we need say nothing, the Navy silently proclaims its own triumph every time a merchantman laden with foodstuffs enters one of our busy ports, where vessels still come and go as they did in the years of peace, and we do not forget that but for the work of the Navy these ports would be as silent and deserted as are those of our enemies.

At the outbreak of war, except those outpost vessels which were at large upon the oceans of the world, the whole German fleet was at once blockaded within its harbours, where, defended by its mine-fields and submarines, it has remained—save for one or two hurried and disastrous excursions—ever since. The few vessels which remained out upon the high seas were after a short and not very serious period of commerce raiding, finally swept away by the destruction of the *Emden*, following quickly upon the decisive battle of the Falkland Islands on December 8, 1914. The seas were then completely free, and save for a shortage of tonnage due to the necessary requisitioning of ships by the Government for the transport of troops and supplies, it appeared at the time as if the merchant service would have been almost unaffected by the war. This shortage of tonnage was accentuated by the fact that with few exceptions the building of merchant ships ceased at the outbreak of war, the whole of the shipyards being commandeered to meet the demands of the Navy.

Early in 1915, however—on February 18 to give the exact date—the Germans issued their famous "Submarine Blockade of England" order, in which they threatened to sink any British or Allied merchant ship coming to or from these shores, and thenceforward contrary to all the rules laid down by the Hague Convention, and with a ruthlessness and a barbarity that will for ever leave a stain upon the escutcheon of the German Navy, she did her utmost to strangle that seaborne trade which is so essential to the life of this country. This blockade which culminated in the never-to-be-forgotten crime of sinking the *Lusitania* on May 7, 1915, was, however, thanks to the tireless efforts of the Navy and to the indomitable courage of the men of the merchant service, gradually surmounted by the destruction of large numbers of the enemy undersea craft, and throughout 1916, although there was a continuous though small stream of losses which greatly strained the already depleted merchant tonnage available, the trade of this country was carried on as regularly as hitherto, save that it was now still further limited to the transport of essentials.

The failure of this first submarine blockade caused the Germans to still further disregard the dictates of humanity and not before she had many times carried the threat into execution. On January 31, 1917, she announced her policy of "unrestricted submarine warfare" in which she threatened to sink all ships, whether British, Allied or neutral which entered into the so-called "danger zones." The results of this latest blockade are too recent to need recapitulation. We can but record that it ranged practically the whole of the civilised world against her, and moreover, grievous as have been our losses both in men and ships, these show signs of gradually becoming less and less, whilst the spirit of our merchant seamen is as undaunted as ever. But the serious depletion of our tonnage has caused the Government to not only release part of the man-power of our shipyards for the purpose of building merchant ships, it has led to the initiation of a scheme of "standardised shipbuilding" whereby it is hoped to turn out an ever increasing number of cargo vessels which shall gradually make good the losses due to the action of enemy submarines. It has been stated that it is the hope of the Government to build 3,000,000 tons of merchant shipping a year, but whether they will succeed in doing this in view of the magnitude of the task, and whether this is equal to or in excess of the amount of tonnage sunk, it would be idle to say, but that a vast amount of labour is now engaged upon the production of cargo vessels is well known.

There is, however, one phase of the question which must not be overlooked, and that is the position of merchant shipping at the conclusion of hostilities. Whilst it would appear that a large number of cargo steamers will be available, nothing is yet being done to replace the high-powered vessels that have been sunk. That there will be a serious shortage of passenger liners is obvious when one considers the fact that a heavy toll has been taken of these during three years of war and nothing has been done in the way of construction. Save for those enemy liners which were in foreign ports at the outbreak of war, Germany has the whole of her not inconsiderable fleet of passenger boats available for instant use at the conclusion of hostilities, and it is reported that there is much activity in enemy yards directed to the increase of this fleet. That this will seriously affect our position after the war has already been pointed out by Lord Furness, and we are glad to know that a number of leading shipowners have addressed a letter to the Prime Minister upon this subject. We consider that the problem of rebuilding the liner fleets of the country is one which demands the immediate and urgent attention of the Government.

OWNERS AND SHIPBUILDING FACILITIES.

THE other day a writer in a London evening newspaper casually suggested that the Controller of the Navy who has to do with merchant shipbuilding was the repository of a secret of great importance. What the secret was he did not indicate further than to convey an impression that it had something to do with the building up during the war period of "a great national asset," news of whose existence would come as a great surprise to the man in the street. We may be wrong, but we draw the conclusion that the cryptic allusion was to the fleet of merchant ships which the State is getting together. If we are right, some interesting considerations naturally arise. It is quite true—at any rate, for all we know to the contrary it is quite true—that when the war comes to an end the State will be a considerable owner of cargo vessels. What the total tonnage of its fleet will be would be improper to say, but there is not the least doubt that, including ships purchased as well as ships built, the aggregate will be, as we have suggested, considerable. The State-owned ships will certainly represent a national asset of very great importance.

Until he saw this printed allusion to the matter the man in the street probably did not trouble himself to think about the ships as a national asset. In the new light shed by the paragraph he is, however, inclined much more closely to examine the matter; and so is the British cargo boat owner. Both seem to be rather anxious now, to know what exactly is meant by the words "national asset." Is the State going to stay in the cargo shipping business after the war? Or is its idea to sell the ships on easy, reasonable terms to British owners? A more or less official statement is, of course, on record that the standard ships will be available for owners who care to buy. But is the State's intention to make the market profits—which are bound to be large—out of the deals, or is it to help British shipowners to rebuild their organisations which have

been, to all intents and purposes, destroyed by the State's interference ? The cargo boat owner may be told that he need not worry on these accounts. The Government's idea is not, it may be said, to get the last penny out of the deal, nor has anybody in authority the least intention of staying in the shipping business. But if German State Socialists see profit in post-war shipping and shipbuilding, what is to hinder British advocates of national ownership also seeing it ? Professor Flamm has definitely proposed that the German Imperial Government should nationalise and develop both industries in order that the State shall reap the benefit of the high freights ruling after the war.

Neither the man in the street nor the politician has, of course, much sympathy with the shipowner just now. He need not, however, on that account be as blind to the facts of the matter as he usually is. Put in a nutshell, the position of the shipowner—the tramp owner as well as the liner owner—is that, owing to the State's control of the shipbuilding industry, he cannot repair the natural and war wastages of his tonnage, and in that way prepare for the intense post-war competition which is ahead. We are not alluding, be it noted, to the State's control of shipping which involves hardships of its own, but to its control of shipbuilding. Practically since the outbreak of war the shipowner has been shut out of the shipyards. What happened in 1915 and during the greater part of last year need not be recalled. A fact to which the general public's attention may be more profitably directed is that the merchant ships which are being built now by the State are not the ships the great majority of owners would have built if they had been at liberty to make up the wastage of the United Kingdom's mercantile marine as their experience indicated it ought to be made up.

In saying so, we are not arguing that the standard ships are bad, or even that the policy of which they are the concrete expression is unsound from the point of view of the war period's needs. Our point is that in carrying out the war policy the State is seriously jeopardising the future of British shipping. Liner owners are quite frank about it ; the standard ships can be of very little use for their trades. A great many cargo boat owners are in much the same position. The vessels are bound to be less efficient in their trades than the vessels they would have ordered if they had been free to do so. We may be told that, if that is the case, we have less reason than ever to worry about State ownership. If State ownership is a financial failure the State will drop the idea. It need not be overlooked, however, that the State as shipower would have advantages and privileges which were unavailable to the private owner, and that before the hopelessness of the enterprise was established the private owner might be made to suffer more than even the Chancellor of the Exchequer thinks he deserves to suffer.

To argue along that line is, however, to go away from the point which is, stated bluntly, that in shutting private owners out of the shipyards in order to build up its "national asset" of great importance, the State is imperilling the future of British shipping. It is time there was clearer realisation of that in official circles. Liner owners and cargo boat owners ought, without delay, to be given facilities for repairing the wastage of their fleets in the way which experience suggests it ought to be repaired. There was no national asset of greater importance in pre-war days than the privately-owned British Mercantile Marine, and there will be none in days to come, we may be sure, if owners are treated intelligently.

SUPERHEATED STEAM.

IN an article published in the July 12 issue of this paper the advantages obtained in steam economy by the use of superheated steam were discussed, and the importance of using high temperatures of admission for the securing of the best thermal efficiency of the steam engine is clearly shown. It was pointed out by the writer of the first and was also shown by the writer of the article on the working cycle of heat engines, that with the rapid growth in steam pressures for relatively small increments of temperature, the upper temperature limit is soon reached owing to the practical difficulties involved in the construction of steam boilers to withstand the higher pressures. In his article on heat engines, the writer stated that in order to obtain the full advantages of high initial temperatures, and to enable the cycle of operations to approach more nearly to that of the ideal cycle, it was necessary to employ a gas as the working fluid. With steam as the working fluid, higher temperatures of admission can, of course, be obtained by the further heating of the steam at a constant pressure, above its temperature of saturation, which is generally termed "superheated steam," but it may be as well to point out that the thermal gain theoretically is not in the same ratio as that obtained by the use of a perfect gas, owing to the fact that in the former case the heat of admission is taken in at varying temperatures ; the bulk of the heat being received at much lower temperatures than that of the upper limit. With the latter fluid working on the ideal cycle, the heat is all taken in at the upper limit of temperature and would, therefore, satisfy the conditions necessary for the obtaining of highest efficiency. With superheated steam, however, the interesting fact has been proved in practice, that the actual gain in economy obtainable is greater than that theoretically possible both with reciprocating and turbine engines. With the former type, the initial condensation that occurs with steam in its saturated state is materially reduced, and the losses by leakage through valves and glands are also considerably less. With the turbine engines the indirect gain is principally due to the reduction in friction losses in the blades and steam passages, and owing to these causes the theoretical gain is increased by nearly one-half again, taken on a basis of heat units available. Taking, for example, steam at 200-lb. pressure expanding to 28-in. vacuum; by superheating to 200° F., the increase in heat units available will be about 12 per cent., whereas the actual reduction in the steam consumption will amount to from 14 to 18 per cent. In steam turbines, especially of the reaction type, the chief objections to the use of superheat for marine work has been the liability to blade stripping, owing to the fine tip clearances necessary with this type, in order to minimise the losses through leakage. By the introduction of a wheel of the impulse type at the steam inlet end of the turbine, a considerable proportion of the total heat drop available can be dealt with by this wheel, with the result that a normal temperature of steam can be maintained on the reaction blading. By making the high-pressure portion of cast steel instead of cast iron, the troubles incurred due to growth of the latter material under heat and the attendant distortion of turbine casings are minimised. With turbines of the pure impulse type and relatively wide tip clearances, the liability to strips occurring under high degrees of superheat is very small. At the present time there is under construction quite a number of these turbines of the geared type designed to operate under superheated steam of from 150° to 200° F. above the saturation temperature, and with working pressure up to 250 lb. per sq. in. The degree of superheat which it is possible to work to depends on the design and type of engine employed. With the ordinary triple-expansion marine engine the initial temperature is limited to from 500° to 550° F., owing to the difficulties incurred in lubrication of the valves and piston rings above this temperature. With turbine work, temperatures as high as from 650 to 750 deg. in land practice have been worked to, and with the small geared turbines now employed in marine work, and with suitable superheating apparatus, there is no reason why these temperatures should not be approximately reached. With the high temperatures, however, suitable blading must be fitted in order to allow for reduction in strength of the material under heat. For a temperature not exceeding 400° F. in the first stage, ordinary brass composition blading has proved quite satisfactory ; but above this temperature bronze or steel blading containing a small percentage of nickel should be used. The best type of super-

heating apparatus is an open question among engineers. The independently-fired type is favoured by some, although this entails extra fuel to be burned; whilst others lean towards the well-known types placed in the boiler uptakes. By the installation of water-tube boilers working at high pressures considerable advantages in space and weight are obtained, with the further advantage that sufficient superheating surface can be easily fitted to give these higher temperatures, and with oil-fuel burning, some very satisfactory results have been obtained in conjunction with water-tube boilers of the triangular type.

PUBLICATIONS RECEIVED.

[*A short notice of any publication does not necessarily preclude the subsequent appearance of a longer review.*]

Radiodynamics. The Wireless Control of Torpedoes and their Mechanisms. By B. F. Miessner. London: Crosby Lockwood & Son, 7, Stationers' Hall Court, Ludgate Hill, E.C. $8\frac{1}{4}$ in. $\times$ $5\frac{3}{8}$ in. $\times$ $\frac{5}{8}$ in. 206 pp. 112 illustrations. Price 9s. net.

In this interesting book the author stands only upon the shore of a new continent that has just been discovered by Science. We have not yet ceased to marvel at the wonders of wireless telegraphy, but if electro-magnetic radiations can be made to wing the thoughts of man across a thousand miles of space, who can tell but that these same waves may not be harnessed so as to render them capable of doing far more than merely vibrating the receiver of a telephone. We have all of us dreamed of the wireless transmission of electrical energy, but when we remember that of the energy transmitted from a radiotelegraphic transmitting station only 10^{-13} of this is received at a distance corresponding to the maximum working range, it will be realised how weak are the forces available.

That these minute forces have been utilised for controlling distant mechanisms without artificial connecting means is shown in this book by the descriptions of many successful experiments, though because the applications of this new art have been of a military nature the volume is concerned for the most part with the applications of radio-dynamics to torpedo-control. Not only are the applications of Hertzian, *i.e.*, electro-magnetic waves discussed, but other forms of radiations such as sound waves, heat waves and light waves are also considered, and in connection with sound waves an interesting account of submarine signalling—which is playing a not unimportant part in the present fight against the U-boats—is given.

But though much has been done, much more still remains to be done, and those interested in the problems of wireless control of mechanisms will find in this book a full record of all that has been done, and much to stimulate their imagination in the direction of what may yet be done. The subject matter is treated in such a way that it is made intelligible to the general reader without sacrificing the technical exactitude which makes scientific work of value to the trained engineer.

Naval Architecture. Part I. By J. E. Steele, B.Sc., M.Inst.N.A. London: Cambridge University Press, Fetter Lane, E.C. 4. 9 in. $\times$ $5\frac{3}{4}$ in. $\times$ $\frac{1}{2}$ in. 141 pp. + 121 diagrams. Price 5s. net.

It is an axiom in the academical world that the books published by the Cambridge University Press are always amongst the best of their class, not only from the point of view of the care which is exercised in the choice of the subject matter, but also because of the able and concise manner in which it is presented; and this little treatise on Naval Architecture which is the latest addition to the well-known Cambridge technical series, maintains the high standard set by its predecessors.

The book is designed to cover just what is required for a first year course in practical shipbuilding, theoretical naval architecture and ship drawing; and with that end in view the author, whilst pointing out the fact that types of vessels vary and that practice differs from one shipyard to another, considers those principles which may be said to underlie all ship construction, and illustrates those principles by reference to the usual practice adopted in the construction of the ordinary transverse framed merchant vessel.

The book is divided into two parts, the first being devoted to the practical work of construction and the second to easy calculations. In the first part, consisting of six chapters, the construction of the hull of a small merchant ship is considered step by step, the various processes being clearly described and well illustrated by clearly drawn diagrams. Where such are liable to be met with in actual practice, alternative methods of construction are given.

After a preliminary chapter on the erection of the berth, keel blocks and staging, the marking, bending and bevelling of the transverse frames are described. Then follow other chapters dealing with the assembly of the component parts of the transverse frame, their plumbing and horning and so on for all the consecutive operations required for the completion of the hull together with its water-tight bulkheads, decks, double bottom, longitudinal stringers, &c. Each detail is illustrated by drawings which are frequently dimensioned, and these dimensions—although this is unfortunately not stated in the text—refer to a cargo vessel of about 2,000 tons displacement.

In the second portion of the book, which is divided into two chapters, simple calculations are given. The first of these chapters deals with the determination of the area of irregular figures, and the well-known Simpson's Rules are clearly explained, these being illustrated by actual numerical exercises fully worked out. The second chapter is devoted to the calculation of volumes, displacements, and the determination of the various coefficients such as fineness coefficient, block coefficient and prismatic coefficient, which are required by the naval architect. There are 25 numerical exercises set to these two chapters, the answers being given for purposes of verification. These should prove of great value to the student, as also should the 25 graded drawing exercises. There is a very comprehensive index at the end of the book which should facilitate reference.

This is certainly the best elementary treatise on the subject of Naval Architecture which we have seen, and one which should prove of the utmost value to the young student on the threshold of his studies, whilst those more advanced will be amply repaid for a perusal of its pages. We shall welcome the appearance of the succeeding parts of this work.

GOVERNMENT USE OF BUSINESS MEN.

The suggestion made by the London Chamber of Commerce in its report on the Government Control of Trade, that the Government, in commercial undertakings, should avail itself more extensively of the services of the business community, finds support in the view expressed by the Empire Resources Development Committee, that our Civil Service Departments as at present organised and staffed, are quite unsuited for the successful conduct of commercial enterprise, lacking as they do, the necessary training and incentives to energy.

It would be erroneous to infer, however—as Mr. H. Wilson-Fox, M.P., the Hon. Secretary of the Committee, points out—that the State cannot manage any commercial undertaking successfully. Past failures or but partial successes—such as the Post Office, telegraph and telephones, and the association of prominent business men with various administrative Departments—have been due to the inadequate recognition of the above principle; and the Committee, in advocating the development by the State of the natural resources of the Empire with a view to paying the Empire's War debt, has consistently laid it down that any Board appointed for the development of Empire resources should be composed chiefly of business men with a wide general knowledge of affairs and a practical acquaintance with the administration of large business concerns—men, that is, accustomed to judge of important financial proposals, experienced in the selection and handling of experts and staffs, the placing of contracts, the purchase of plant and supplies, and other similar matters. In the opinion of the Committee, the Board should not be composed of whole-time men, partly because it would derive great benefit from the advice of men having daily experience of the direction of affairs similar to those with which it would be concerned. Subsidiary Boards charged with the practical development of any particular industry or enterprise should be remunerated, as is usual in undertakings of the kind, by a percentage of the profits over and above an adequate salary. Personal fitness, rather than social or political prestige, would thus be the primary qualification.

OBLIGATIONS IMPOSED UPON SHIPPING.

(From a Correspondent.)

The following particulars relate to the sacrifices incurred by this country owing to obligations imposed upon shipping as a result of the war :—

1. The ocean-going vessels on the United Kingdom Register before the war represented between 17 and 18 million tons gross. Of this tonnage over 15 million tons were regularly employed in trade with the United Kingdom, the remainder being engaged in trades between foreign countries, the various parts of the British Dominions, &c., and incidentally rendering by their earnings important services to the mother country. A large amount of this distant trading has been sacrificed to our immediate needs and nearly 50 per cent. of the ships concerned brought home for British trade. At the present time, inclusive of prizes, the ocean-going shipping on the United Kingdom Register is a little over 15 million tons, of which 14,000,000 tons are employed in home service.

2. Of the 14,000,000 tons thus employed, however, only about one-half is available for the trade of the country. About 6½ million tons have been allocated entirely to the needs of the Navy, the Army, the Allies, and the Dominions overseas. A further million tons, or thereabouts, is being used for these purposes on the outjourney, and is therefore lost to our export trade, but is available for imports.

3. The services rendered by the mercantile tonnage which has been taken up for the purposes of the war are very varied. A considerable number of the speediest and most efficient vessels in our mercantile marine have been converted into auxiliary cruisers, and others into magnificent floating hospitals. A whole fleet is engaged in taking coal and oil to the Navy; many of our mercantile ships have been converted into transports, and are constantly carrying troops from Great Britain and the British Dominions to all fields of war; many are occupied in taking supplies from all parts of the world to the Navy and to the Armies at the various fronts; others in mine-sweeping and patrol work in all seas; a very substantial number have been assigned to the Allies to supply their urgent needs for munitions and other imports, and a large number have been told off to carry wheat and other essential foodstuffs to the Allies. Some idea of the services rendered by our ships in these directions will be gained from the following quotation from a statement made in the House of Commons by the First Lord of the Admiralty (Sir Edward Carson), on February 21 last :—"I have a Return here which has been brought up only to October 30, 1916. You may, however, take it from me that in proportion the same amounts are being transported at the present time. In regard to personnel, the total numbers that we moved across the seas up to that date were 8,000,000 men. . . . Take supplies and explosives. Up to October 30 of last year we had moved 9,420,000 tons; . . . sick and wounded over 1,000,000; horses and mules over 1,000,000; with petrol alone amounting up to 47,504,000 gallons."

4. The situation described above, of course, did not arise at once, but from the beginning of the War British ships have steadily been requisitioned by the Government and run in the National instead of private interest. The rates paid to shipowners soon became very much lower than the freights which could be earned by free ships, and British shipowners have therefore been unable to rely upon earning the same freights as their competitors. Now the situation has reached a stage at which it has been necessary to take complete control of all British shipping in order to ensure the employment of every vessel in the manner and on the terms as to rate of freight most consistent with the national interest. The result may be summarised as follows :—

(1) With the exception of a few vessels engaged in distant waters on work which is vital to British Colonies and of vessels chartered to France and Italy, the British Government has requisitioned for hire at Government rates about 97 per cent. of the ocean-going tramps on the United Kingdom Register.

(2) All British liners have been requisitioned and are being run for Government account. The owners receive hire at Government rates and the profits derived from private freight carried at market rates go to the Government and not to the shipowner.

(3) Every ocean-going voyage of British steamers is now directed by the Government, who have regard only to the question of how they can obtain essential imports from the nearest source, and disregard both the interests of the shipowner and the exporter.

(4) Many trades built up in distant waters and sustained by British industry have had to be abandoned to neutral owners who gladly seek employment for their vessels in areas immune from war risk.

(5) The coastal traffic round the shores of the United Kingdom is being subjected to a searching review for the purpose :—

(*a*) Of withdrawing vessels which can be utilised for ocean-going work, and

(*b*) of bringing about a limitation of rates wherever possible.

5. It is necessary to emphasize the effect of the Liner Requisitioning Scheme referred to above upon the shipping industry. The owners are placing all their organisation and resources at the disposal of the Government for running the requisitioned liners. They have also agreed to pool their organisations, and this has, of course, necessitated the closest co-operation between what may have been competitive interests before the war. In many instances the trades built up by the shipowners must suffer severely from the depletion of shipping caused by the diversion of the steamers from their usual routes.

6. A further point which should be borne in mind is the extraordinary risks which the officers and crews of merchant vessels have to run in order to bring the necessary commodities into this country. The areas round the British Isles have been singled out by the enemy for special attack, but notwithstanding the risks involved, officers and crews have not made any difficulty about taking their ships through the most dangerous routes.

7. Apart from the effect upon shipping interests, the country generally has also had to suffer great and increasing sacrifices by the shortage of tonnage caused by war requirements and submarine losses.

(1) The diversion of liners from long-distance to short-distance trades has inflicted injury on many British export trades (particularly to India and the Far East) and also upon the interests of our own distant exporting Colonies.

(2) A very far-reaching programme of restriction of imports has been put into effect. Luxuries (including many commodities produced by our Colonies and our Allies) have been excluded, and the import even of essential articles has been reduced to the lowest level compatible with national security.

(3) The restriction of coasting facilities will create some inevitable hardship for coast towns which have hitherto relied on seaborne supplies of coal and other commodities, for the railway services of the country are already overstrained and cannot wholly fill the place of the coasting tonnage which will have to be withdrawn.

It is, however, desirable to consider in greater detail the effect upon the exports and imports of this country.

8. Necessarily our imports have been severely curtailed. Before the war we were importing at the rate of about 58,000,000 tons a year. In 1916 our imports fell to about 43,000,000 tons and in the present year it will be considerably less. Even this large reduction does not exhibit the full amount of the sacrifices which we have made both of articles for our own consumption and of commodities for manufacture and export to our world customers. Of the

58,000,000 tons which we imported before the war foodstuffs were rather less than a quarter. The rest was practically all employed or consumed in promoting the industries and commerce of peace. In 1916, however, two-thirds of all our supplies from overseas consisted of foodstuffs, munitions of war, and the material for the manufacture of munitions, leaving only one-third (of a greatly reduced total) for productive industries. That is to say, while before the war we could and did import upwards of 40 million tons a year for the purposes of industries and commerce, we obtained in 1916 only some 14 or 15 million tons for these vital purposes; and in the present year we cannot look forward to getting nearly so much as even this reduced quantity.

9. An examination of the value of our imports yields equally significant results. In 1913 our total imports were valued at 769 millions sterling, of which about 94 millions came from the countries with which we are now at war. In 1916 our imports were valued at 949 millions sterling, the enemy countries being of course eliminated from this figure. The great rise in prices accounts for a large part of the phenomenon of an increase in value with a decline in bulk; but on the best estimate that can be made, it would appear that if in 1916 we had imported the 43 million tons of goods which we obtained from the same countries and in the same proportions as we imported before the war, they would have cost us rather less than 800 million pounds. We paid, therefore, in the year 1916, 150 million pounds more than our imports would have cost us if we had continued to buy the same class of commodities and from the same sources as before the war. We have therefore not only sacrificed, ruthlessly, the needs of industry and commerce; we have in addition paid a far higher price for the unproductive material of war which circumstances have compelled us to substitute.

10. The figures as to the exports of the produce and manufactures of the United Kingdom are such as would be expected from the statistics already given. In the year 1913 these exports were valued at 525 million pounds. In 1916 exports were valued at 506 million pounds, but if these exports had been priced on the 1913 level their values would have been only 386 million pounds. We have therefore reduced our export trade by about 26 per cent., 10 per cent. being exports to our present enemies and the remainder exports to the other parts of the British Dominions, to our Allies, and to other foreign countries. Our exports to our Allies have increased to some extent, as would naturally be expected; though this increase, representing as it does a special and transient feature of the present situation, affords no substitute for the loss of permanent trade. Our exports to other foreign countries and to the Dominions overseas have fallen off in value by about 100 million pounds, representing on their pre-war figure of 337 millions nearly one-third of the whole.

11. The foregoing figures as to Imports and Exports relate to our whole trade, a substantial part of which is carried in foreign ships. If it were possible to analyse separately the carrying trade of British ships, the comparisons between the conditions preceding the war and those obtaining at present would be still more striking. It has been explained in the first paragraph that about 50 per cent. of all British tonnage which formerly contributed to the National Revenue by its earnings in distant trades has now been brought home to supply our own urgent needs; there are indications that the gap thus created is being filled to some extent by neutral shipping, which has been withdrawn from European trade to take advantage of the profitable opportunity of obtaining the business which the British people is, for the time being at any rate, compelled to surrender.

BRITISH EAST AFRICA LAKE TRADE.—It is fully expected that efforts will be made to develop traffic on the African Lakes by means of motor boats. On Lake Kioga, which is the centre of a territory in the British East Africa Protectorate, with trading possibilities that are immeasurable, there are at present 18 ports, three steamers and a fleet of 100-ton lighters.

NORWEGIAN DEVELOPMENTS.

During 1915 the Norwegian merchant fleet was increased by the addition of numerous foreign vessels, but there was a decrease during 1916 in spite of exceptional additions by new constructions and purchases. During last year, Norwegian yards delivered 37 vessels (31,000 tons) for Norwegian owners, and 52 new vessels (123,000 tons) were obtained from abroad, viz., 18 (60,000 tons) from America; 21 (17,000 tons) from Holland; 3 (16,000 tons) from Great Britain; 3 (13,500 tons) from Japan; 4 (8,000 tons) from Denmark; and 3 (8,000 tons) from Sweden. In addition 227,000 tons were purchased abroad, the vessels averaging 13·6 years of age and coming from the following countries:—

Land of origin.	1916. No.	1916. Gross tons.	1915. No.	1915. Gross tons.
Greece	13	37,865	30	80,690
Sweden	30	39,323	48	52,763
Spain	9	17,461	19	43,254
Holland	19	25,040	20	35,692
Denmark	18	20,751	15	22,757
U.S.A.	19	51,321	2	3,790
Great Britain	—	—	30	63,186
Other countries	25	35,860	14	22,825

Sailing vessels purchased during 1916 totalled only 18, of 6,220 tons total, compared with about ten times that tonnage in 1915. The decrease in purchases was due solely to the prohibitions in most countries and has become yet more pronounced this year. During the first quarter of 1917, purchases from abroad totalled only 10,000 tons. About 78,000 tons were sold and 327,000 tons lost during 1916; the net decrease was 125 vessels and 25,595 tons. The average tonnage increased considerably, most of the purchased vessels being large. Losses during the first four months of this year were greater than during the whole of 1916.

GERMAN VIEWS ON U-BOAT LOSSES.

Hamburger Nachrichten publishes what appears to be an "inspired" note from Berlin concerning the Allies' shipping losses and shipbuilding possibilities. The text adopted is that it is easier to destroy than to build (by the way, does not this apply to U-boats as well?) and the conclusion reached is that the Allies' losses are three or four times as great as the combined production of British, American, French, Italian and Japanese yards. This surprising conclusion is reached by accepting "German Official" data concerning losses, by comparing these with (supposed) building data on a monthly basis, and by wisely selecting as the psychological moment for preparing the article, the last day in June, when only the data up to the end of May were available.

A diagram is given showing graphically the losses month by month and also the estimated output of new tonnage, the latter being based on the following values for the gross tonnage built per month by the countries named:—

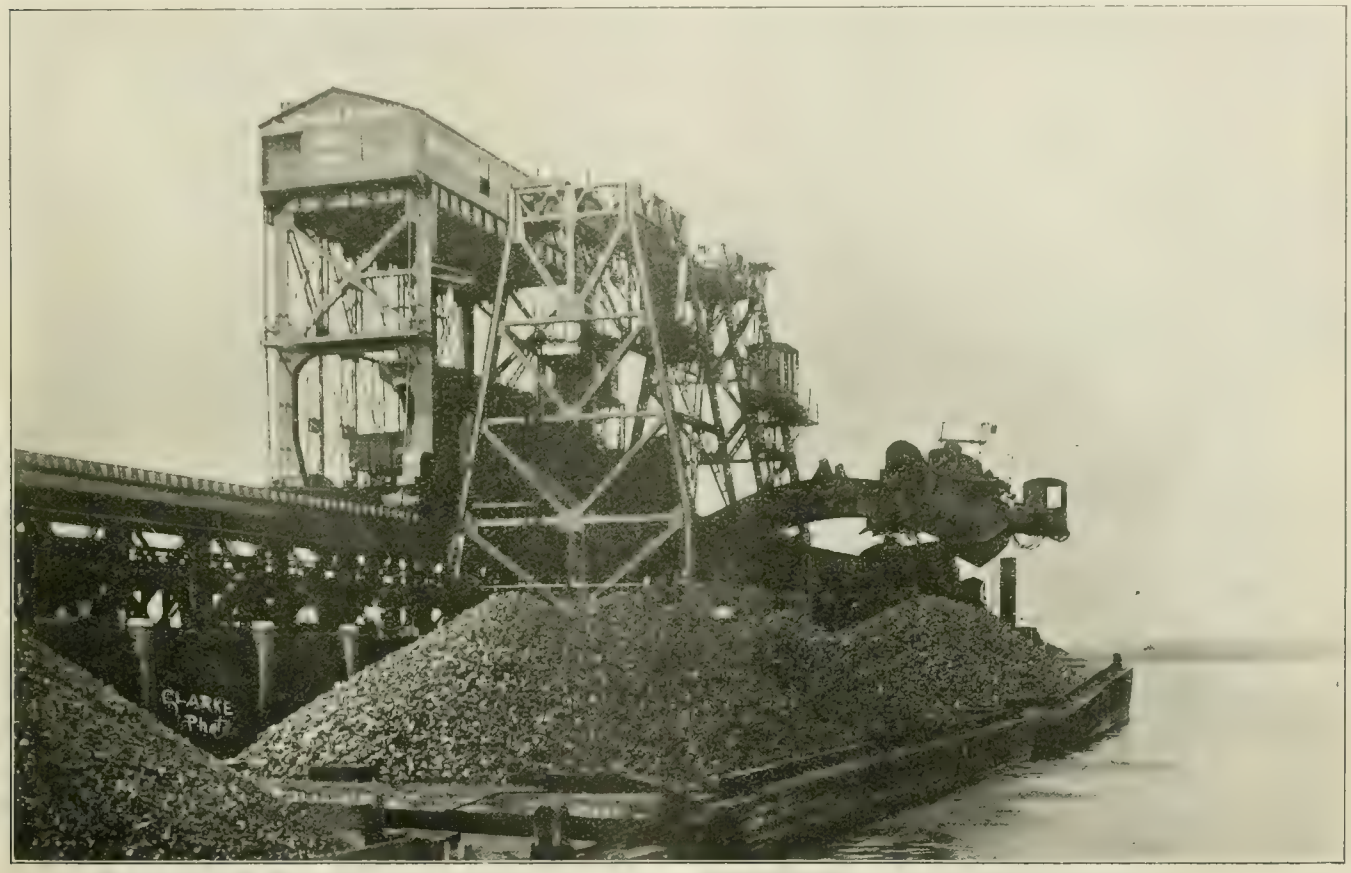
	1916. Gross tons register.	1917. Gross tons register.
England and British colonies	52,666	104,166
U.S.A.	46,250	125,000
France	3,250	3,334
Japan	20,500	25,000
Italy	5,000	5,000
	127,666	262,500

The values for 1917 are said to represent "maxima which include the far-going plans of England and the U.S.A. to double and treble their output, plans which cannot be executed in reasonable time." The curve which is claimed to represent simply war losses caused by the Central Powers rises fairly steadily from 100,000 tons per month in July, 1916, to 400,000 tons in October, 1916; thence at a slower rate to 440,000 tons in January, 1917; and thence to 780,000 tons in February and 1,091,000 g.t.r. in April. The figure given for May is 869,000 tons, and, serious though our losses by U-boat are and will remain, the enemy is unlikely to gain much comfort from the present and future course of his loss and production curves. Subject to fluctuations, losses will decrease and production increase. The U-boat cannot win the war.

CHARLESTON AS A COAL PORT.

Charleston, South Carolina, is at present by no means a large factor in the business of coaling and bunkering ships on the Atlantic seaboard. Nevertheless, because it is a proper tidewater outlet for certain coal districts inland, because the port is now equipped with a very modern coal pier, and because of its possibilities as an exporter of coal and a shipper through the Panama Canal, we must not neglect to consider this tidewater terminal. The City has a population of only about 65,000, but it represents important territory inland.

In addition to certain modest provisions for handling coal, there has now been added by the Southern Railway Company a good-sized modern pier. The design worked out here differs in one or two important particulars from those of other piers along the coast. One of the great problems with coal piers is how to get the coal to the piers and then deliver it transversely over the side of the pier to the ship. With the older piers, it is quite customary to run the loaded railway wagons to the pier, then to dump the coal into bins or pockets, and finally to effect a delivery to the ship by means of chutes. A variation from this is introduced at Hampton Roads in the most modern piers erected there. The coal is dumped from the railway wagon into a special pier wagon, and this, after being elevated to the pier, deck runs out on to the pier and dumps into the bins. At Charleston, the new pier is provided with tracks at two levels. A pair of them extend longitudinally out, occupying a central position. These tracks have the higher elevation. Alongside, to the right and left, single tracks run at the lower level. The difference in levels is considerable, being about 17½ ft. On the elevated tracks wagon dumpers mounted on wheels and self-propelling run backwards and forwards, thus securing a considerable variation in position. In fact, a tipper takes up a position opposite a hatch to which it is proposed to deliver coal. The coal itself is brought to the tipper by the ordinary railway wagon which has come down to tidewater from the mines. The wagon with its load is moved up on to a slightly elevated platform carried in the cradle of the dumper. This platform carries a short length of track sloping up at the entrance side of the dumper and down at the exit side. The slope down is to facilitate the discharge of the empty wagon after its load has been emptied out and the wagon returned. After the loaded wagon has arrived on the platform, the dumper proceeds to overturn the wagon sideways. This is in agreement with the general American practice to construct dumpers to effect the overturn on the side. This procedure requires a rotation of the wagon in excess of 90 degrees. Some of the very recent American dumpers have a maximum overturn of 160 deg. With dumpers such as those at Charleston, it is unnecessary to provide for opening the wagon on the side or anywhere. The load is very quickly got out. The empty wagon is then returned and passes out from the dumper *via* the exit incline. The coal when it is dumped falls into a kind of broad funnel called an apron. With ordinary dumpers elsewhere the apron usually converges and discharges into a delivery chute, and this chute in turn discharges into the hold. The movement from the apron and through the chute is obtained by gravitation. At Charleston, the apron, or hopper, discharges not into an ordinary chute leading to the hatch of the vessel, but into a conveyor operated by power. This conveyor is mounted in a steel tower on wheels, and this tower moves along on one of the lower tracks under its own power. Prior to the dumping operation, this conveyor tower moves up to a position opposite the hatch. The hatch will, in consequence, have opposite it two tall structures—the one being the wagon dumper standing on the



Southern Railway Pier at Charleston. Loading Barges.

Note the curved boom extending out over the barge. This boom supports the scraper conveyor which conveys the coal from the receiving hopper.

elevated track, the other being the conveyor tower standing on a lower track. This conveyor consists in part of a long curved arm, the curve being in a vertical plane with its convexity upwards. By means of suitable mechanism and steel ropes, it is possible to raise and lower the outer end to suit the conditions at the moment. This conveyor arm is provided with an endless chain carrying two steel flights, each 2 ft. high and 8 ft. long. These are arranged at intervals of 3 ft. When the chain is operated, the steel flights shove the coal along the conveyor arm, carrying it outboard over the edge of the pier and over the hatch. The coal is thus got along to a position over the pile in the hold without dropping it. The most severe operation so far has been the dumping into the apron from the railway wagon. But even this is not so severe, as there is little or no drop from the wagon to the apron. The broad or receiving end of the apron may be adjusted vertically to suit conditions. At the outer end of the conveyor arm there is secured a telescopic chute by means of which the coal may be discharged at a variety of points in the hold. The movement of the coal along the arm may, it is understood, be effected at a maximum rate of 150 ft. per minute. The coal may be delivered to the ship at points up to 35 ft. from the face of the pier. Three men control operations. One has a cab on the movable wagon or dumper and from this point controls the unit. The second man is stationed in a cab on the conveyor tower. He manages the movements of his tower along the track, the lifting and lowering of the rear of the receiving hopper into which coal comes from the dumper, and finally the lifting and lowering of the outer end of the conveyor arm. The third man has a cab at the outer end of the arm, from which point he controls the conveyor movement, the telescopic chute and also a rotary discharge elbow arranged at the lower end of the chute by means of which the coal is suitably trimmed in the hold.

The power for all operations is secured from electric motors. Naturally, the motors handling the loaded wagon must be sufficiently powerful. As a matter of fact there are two, each of 200 horse-power. To move the dumper from hatch to hatch a 100 horse-power motor is employed.

Probably the best coal that one will ordinarily find at Charleston will come from Russell County in the south-western part of Virginia. This coal will naturally be first transported by the Carolina, Clinchfield & Ohio Railway, and by it be delivered to the South Western Railway. It is not to be understood from this that the coal will be unloaded from one set of wagons and loaded on to another set. That is not American practice. The ordinary custom is to send coal from the mines to its land destination in the wagons in which it was originally loaded. Whatever breakage occurs takes place in loading at the mines and in transferring from rail to ship.

The C. C. & O. Rly. in 1913 carried 1,236,725 long tons of coal; in 1914, 1,131,324 long tons. Probably some of this coal in either year failed to reach Charleston, but a large percentage must have gone through. We may be sure that the bulk of the coal carried from the mines by this railroad came from Russell County, but perhaps not the whole. This is a new field in so far as distant markets are concerned, its exploitation having begun about 1908, upon the completion of this railway. The average value of the Russell County coal at the mines was $1·15 in 1914. Figures for 1913 are apparently not available, but could not have been greatly different. This coal may very well be an excellent steam fuel, coming as it does from the general neighbourhood of the Pocahontas field.

It is probable that coal from the Warrior field in Northern Alabama finds its way to tidewater outlet at Charleston. This coal is hardly of the highest or nearly highest grade. The haul from the interior of Alabama and across Georgia and South Carolina is about the same as from the West Virginia fields to Hampton Roads. The value of Alabama coal at the mines is greater, decidedly greater, than the corresponding value of West Virginia coals. This fact is to be ascribed perhaps to the proximity of the fields to Birmingham, Alabama, and other iron and steel centres. In 1913, the average value of Jefferson County coal—this county being the one in which Birmingham is situated—was $1·47 per long ton; and of Walker County coal, $1·27 per long ton. This last coal seems to be the cheapest produced by any county in Alabama. In 1914 the values went up a trifle of $0·01 for Jefferson County coal and $0·07 for Walker County coal. Accordingly, even if one can get Alabama coal at Charleston, it does not follow that it will be cheap, despite the probability of its being less than the best in quality.

KEELS AND SHALLOW DRAUGHTS.

When considering the design of a vessel intended to run at a relatively small draught, it is as well to give careful attention to the arrangement of the keel. The designer will have some definite draught in view, and the smaller the amount of this is taken up in depth of keel, the finer the lines of the moulded form can be made. In consequence, the vessel will be more easily propelled or, if a certain weight is being set aside for the machinery, the greater will be the deadweight that can be carried. For this reason, ships with bar keels are the worst that can be used for shallow draughts. Lapped butts and outside straps should also be avoided, not only because they increase the depth of the keel, but for the added reason that they are not desirable in vessels which might often be scraping over the ground. If a good deal of rubbing is expected, a rubbing piece will be fitted, when the keel plates would be flush butted. If a rubbing piece can be dispensed with, it may result in an appreciable addition to the deadweight, which could not otherwise be obtained. In a river steamer about 300 ft. long it was found that the maximum deadweight that could be carried when a rubbing piece 2 in. thick was fitted was 200 tons. If the rubbing piece were dispensed with and the ship given greater displacement in consequence, keeping the same fineness of form, it would be found, after allowing for the extra machinery weight necessary to attain the same speed, that an additional 30 tons of deadweight could be taken, representing an increase of no less than 15 per cent. The consideration of propeller diameter naturally arises from the foregoing particulars. In a shallow-draught boat with any pretensions of speed, it is always difficult to fit a propeller of large enough diameter to give good efficiency and at the same time to obviate the projection of the tip below the line of keel if a working-tip immersion is to be obtained. Various devices have been adopted to overcome this difficulty, chief among them being the introduction of a tunnel in the ship, in which the propeller works. Even with this arrangement, however, the efficiency of the propeller is low, and in very high-speed shallow-draught vessels it becomes impossible to keep the propeller totally above the line of keel. In torpedo boats and destroyers it is the rule, rather than the exception, to find the propeller partly below the line of keel. This is certainly a drawback to the operation of these boats in very shallow water, and will add from 10 to even 50 per cent. to the draught of the hull proper. This puts a serious limitation on these vessels when they are operating in the neighbourhood of shoal water. No risk can be taken, since with such an arrangement any slight scraping of the bottom would result in serious and irreparable damage to the propeller. With propellers driven at high revolutions directly from the turbine, the projection of the propeller below the line of keel is not large, but with the adoption of gearing between the turbines and the propellers, making the latter revolve more slowly, the diameters become very large, and the propeller projection adds to the actual working draught of the boat. It looks as if this is a disadvantage which will have to be accepted; nevertheless, any improvements in this connection would be welcomed.

THE SIMPSON-GORDON PATENT BILGE TUNNEL.

In the design of cargo-carrying vessels, three guiding principles are always kept in view; firstly, the separate cargo spaces or holds must be as large as possible, consistent with the strength of the hull; secondly, these cargo spaces must, as far as is possible, be unbroken by beams, pillars, &c., so as to give unbroken stowage in the holds; and thirdly, that portion of the hull devoted to machinery, bunkers, &c., must be reduced to a minimum.

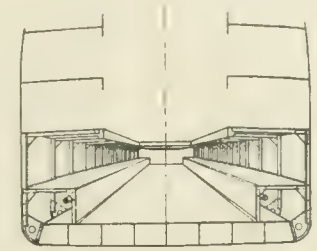
The size of the holds is limited by the necessity of providing a sufficient number of watertight bulkheads, and except by building larger ships it would appear to be impossible to have ships in which the holds are larger than at present. Many different methods have been devised in order to reduce the amount of broken stowage in the holds. Thus it is one of the chief advantages of the well-known Isherwood system of construction that it gives an increased deadweight carrying capacity and an increased capacity for bale goods in the holds for a given size of ship. It is also claimed for the "arch" system of construction that it gives a deeper hold which is absolutely free from all obstruction, there being no pillars in the hold, thus facilitating stowage of cargo.

In order to reduce the space occupied by the machinery, the use of the "Marshall" valve gear may be instanced, in which the valve chests are placed abeam of the cylinders instead of on the centre line of the crankshaft, thus allowing a considerable shortening of the fore and aft length of the engine room, and the fact that this valve gear has not been more frequently adopted is due not to the defects of the arrangement of the valve chests, but to the inherent defects of the valve gear itself; and it is not the least of the advantages attaching to the use of either geared turbines or oil engines for the propelling of ships that the space required by the machinery is thereby considerably reduced.

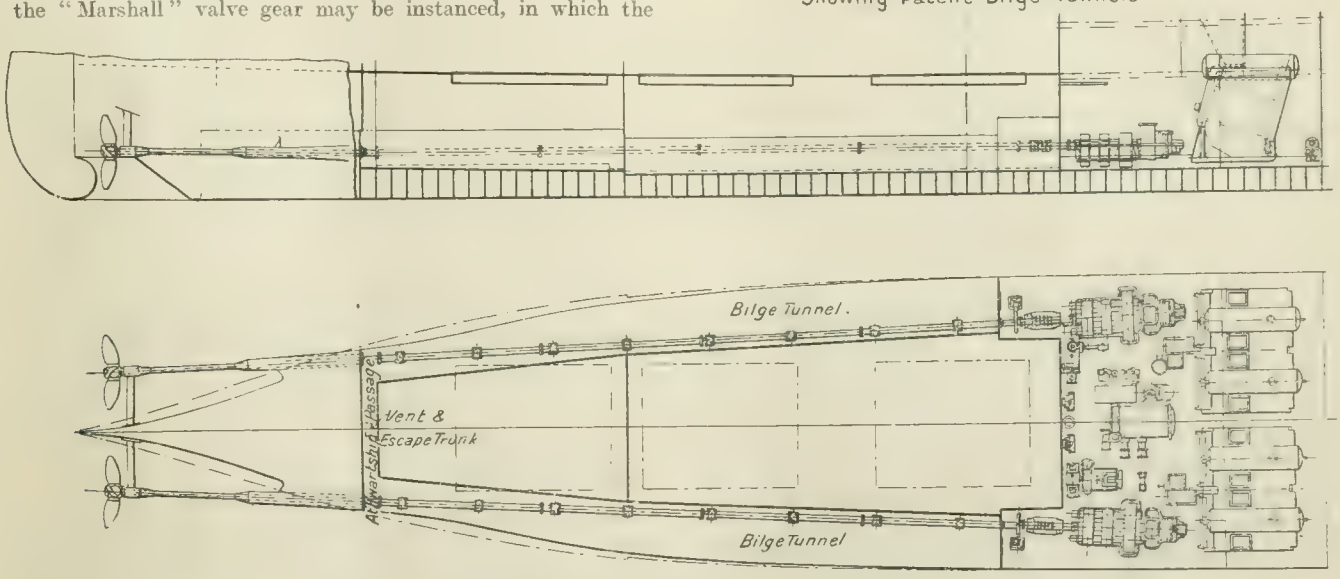
The Simpson-Gordon patent bilge tunnel is one of the latest of the many attempts that have been made to increase the cargo-carrying capacity of a ship without increasing its size. The shaft tunnels are situated at the sides of the hull instead of near the centre line as is usual with twin-screw vessels, this necessitating the location of the propelling machinery in the wings of the engine room, the shafting being led through the tunnels close to the turn of the bilge until it leaves through the stern tubes, which at their forward end are bolted to the after-peak bulkhead. The foundations supporting the shaft bearings are built on the wings of the double bottom and the tunnel itself is formed by the hull plating just above the turn of the bilge, a vertical side plating erected as near to the shaft bearings as possible, and a horizontal top plating secured in a position just giving sufficient head room to enable easy access to be had to the bearings and stern glands for purposes of lubricating, overhauling, &c. An athwartship passage connecting the two tunnels is provided at the after end just in front of the after-peak bulkhead, and from this there is erected an escape trunk to the main deck, which also serves as a vent. The general arrangement of the bilge tunnels is clearly shown on the diagram.

The chief advantage of thus placing the shaft tunnels at the sides of the vessel is that it removes them from underneath the cargo hatchways. This means that broken stowage is entirely done away with, giving a clear and uniformly shaped hold, as can be seen from the diagram representing a section through the hold of a vessel fitted with these bilge tunnels; thus the cubic capacity of the after holds instead of being impaired by broken stowage and wing pockets is all of 100 per cent. value. In addition to this, since the propelling machinery is located in the wings of the engine room, the centre space is available for the auxiliary machinery and condensers, which allows a considerable shortening of the fore and aft length of the engine room. This is also apparent from the diagram. This diagram has been made from the drawings of a vessel fitted with geared turbines, and it will be noticed that the space occupied by the machinery is very small compared with that which would be required by a vessel of the same size having twin shafts as usually arranged, and that the after holds are not only larger in consequence, but an extra hatchway can be provided, thus facilitating the loading and unloading of the cargo. It is also claimed that there is a slight saving in the amount of steel required, as compared with what would be required for twin tunnels as usually arranged.

We cannot at the moment recall any data published showing the effect of inclining the shafts in the horizontal plane relatively to



Section of Lower Holds
Showing Patent Bilge Tunnels



Simpson-Gordon Patent Bilge Tunnel, showing Arrangement of Shafting.

the centre line of the ship—if, indeed, the problem has been considered at all—but it would appear as if the effect of inclining the shafts towards the centre line as they run aft instead of in the opposite direction or parallel, as is usual with twin-screw vessels, might result in a higher propulsive efficiency; because when the shafts are running more nearly parallel to the skin of the ship, the propellers are turning in a plane more nearly at right angles to the direction of the water running past the ship.

The Simpson-Gordon patent bilge tunnels are being fitted in 10 steamers now in course of construction by the Newport News Shipbuilding & Dry Docks Company, of Newport News, Va., for the Luckenbach Steamship Company, of New York. These vessels, some of which are already in service, are being built from the designs and specifications, and under the supervision, of Mr. George Simpson, M.I.N.A., naval architect and engineer, of New York City, who is one of the patentees of the system of bilge tunnels which bears his name.

THE DEVELOPMENT OF MACHINERY IN THE U.S. NAVY DURING THE PAST TEN YEARS.*

(*Continued from page* 36.)

Adoption of Turbines.

Before the advertisements for bids for these two Dreadnoughts were issued the first turbine-propeller battleship, the British original *Dreadnought*, the name of which has been applied as a general name to the "all big-gun battleship," had her trials, and the results were spread broadcast as a world advertisement for this new form of propulsion. It is spoken of here as a new form for the reason that up to this period it had only been used for much smaller, less important installations in destroyers and in the small British cruiser *Amethyst*.

The installation on the *Dreadnought* was of the very simplest type, there being four shafts with high-pressure ahead turbines on two shafts and low-pressure ahead and astern turbines on the remaining two. There were no means whatever provided for increasing economy at low speeds, and the expenditure of steam at these speeds was extravagant.

The new type of machinery, however, immediately struck both the public and the Service fancy, and the Navy Department, yielding to the clamour in favour of the new fashion, invited bids for turbine machinery in addition to those for reciprocating engines.

As previously stated, the engine rooms on these vessels were too small to accommodate any other type of turbine than the impulse or the impulse-velocity compounded type. When the bids were received a satisfactory bid was made by the Newport News Shipbuilding and Dry Dock Company for one ship built according to the Department plans and specifications, that is, with reciprocating engines, while the Fore River Shipbuilding Company offered a satisfactory bid with guarantees of performance for a vessel with Curtis turbines.

The turbines offered were in general similar to those fitted in the *Salem*, but, inefficient and troublesome as they proved themselves later in actual service, they did mark one big step in the development of this now highly successful and economical American turbine, and the development of such a successful completed machine, in my opinion, completely justifies the early experiment and failure in the *North Dakota*. The improvement made consisted in increasing the turbine stages from seven to nine, the last four stages being carried on a drum in place of on separate stage wheels. This was the first appearance of drum construction with turbines of the Curtis and similar types, although it was and is the standard method for those of the Parsons type.

Until the advent of the Curtis turbine the Navy Department had been forced to go abroad for its turbine designs, a position which was extremely undesirable and which justified experiment to the fullest extent to relieve us of the situation.

Forced Lubrication.

During the building of the engines of the *Delaware*, reports were received of the results obtained with forced lubrication on the reciprocating engines of the British battleship *Africa*. These reports indicated such a great improvement over the ordinary method of gravity lubrication that it appeared desirable to incorporate it in the engines building. Plans were at once prepared by the Bureau of Steam Engineering and forwarded to the Newport News Company, with a request that the matter be taken up at once and an estimate for the cost of the change be submitted to the Department in order that authorisation for the additional expenditure required for this improvement might be obtained. This was done and, after some delay, the necessary authorisation was obtained.

The original plans of forced lubrication for the *Delaware* contemplated applying it only to main and crank-pin bearings and to the eccentrics, depending on the original gravity feed for lubrication of crosshead slides, wrist pins and valve-link bearings, and, in conformity with this idea, only those parts having forced lubrication were covered in by the oil casing.

When the vessel was taken out for her preliminary acceptance trials the crossheads and slippers showed a tendency to run warm, and, before the trials, temporary connections through the water-serving piping were made from the forced-lubrication system to these parts. The results obtained due to the forced lubrication were very marked, practically all the vibration and noise to which we are accustomed with the ordinary system of oiling being noticeable by their absence.

The trials, however, demonstrated the desirability of extending the forced lubrication to all the moving parts of the engines, and also that, when extended to the crossheads and slides, a large amount of oil was thrown on the piston rods and lower heads of cylinders, vaporising on the latter, the oil on the piston rods and the oil vapour being drawn into those cylinders where pressures below the atmosphere existed. This oil then passed over to the boilers and caused fear of trouble due to the oiling up of the water side of the heating surfaces.

Development of the Piston-Rod "Steam Seal."

The carrying of oil to the boilers being considered a serious menace, it was imperative that means to prevent it should be devised as quickly as possible, and in aiming at the preventive advantage was taken of the fact that for cylinders in which steam pressures lower than the atmosphere are apt to occur, the piston-rod outer packing must be designed to resist pressure from the outside. As the M.P. and L.P. cylinders are those in which this condition exists, and as the high pressures carried in the H.P. cylinders tend to cause a blowing out of steam along the piston rod, cutting off the oil from the rod and preventing the entrance of oil vapour, it was necessary to apply the preventive to the M.P. and L.P. rods only. The cut finally adopted is now known as the "steam seal," and consists of an outer stuffing box carrying about three rings of elastic packing with a space between the first or lower ring and the upper two, into which steam of a slightly higher pressure than that likely to exist in these cylinders is admitted. When the regular piston-rod packing is properly fitted and is operating properly, the "steam seal" does its work efficiently. When the regular piston-rod packing is not doing its duty the steam seal may aggravate the trouble by blowing through into the cylinders.

In service this system of lubrication proved so satisfactory that little time was lost in extending it to quite a number of the older vessels of the fleet where equally satisfactory results have been obtained. One of the commanding officers of the fleet made the remark to me that we had builded better than we knew, as the reciprocating engine fitted with forced lubrication was quite a different machine from the same engine fitted with gravity feed.

* Abstract of paper read before the American Society of Naval Engineers by Captain C. W. Dyson, U.S. Navy (Member), and published in the *Journal* of the Society for May, 1917.

Only the other day a report was received in the Bureau from one of the armoured cruisers stating that they had just overhauled their crank-pin and main journals after a period of two years' running, and none of the bearings showed the slightest indication of wear. This, in itself, shows the immense decrease in work required to keep these engines in order over that required in the old days before forced lubrication was adopted.

Results of Trials of "Delaware" and "North Dakota."

In the contracts for these two vessels appeared, for the first time, a requirement for the measurement of the steam used, this for the *North Dakota* being accompanied by guarantees that the following steam consumptions per shaft horse-power would not be exceeded :—

Full speed	15·1 pounds
19 knots	16·1 pounds
12 knots	23·2 pounds

The *Delaware's* trials took place off Rockland, Me., in October, 1909, and those of the *North Dakota* off the same place in November of that year. The results obtained were :—

Ship.	12-knot.		19-knot.		Full speed.	
	Del.	*N.D.*	*Del.*	*N.D.*	*Del.*	*N.D.*
Speed	12·24	12·04	19·217	19·21	21·56	21·64
I.H.P. (main engine) ...	3,905	...	16,602	...	28,578	...
S.H.P. (main engine) ...	...	3,757	...	16,712	...	31,862
Coal per I.H.P. or S.H.P. ...	2·673	2·64	1·795	1·63	1·888	1·71
Water per I.H.P. or S.H.P.	19·37	27·12	13·91	16·67	14·32	14·

In advertising the results of this first large Curtis turbine installation, the advocates of the turbine in comparing the two vessels religiously confined themselves to the comparison of coal per horse-power, and always called your attention to the fact that a shaft horse-power was only 92 per cent. of an indicated horse-power, and that, therefore, the fuel consumptions were :—

	12-knot.	19-knot.	Full speed.
Delaware ...	2·9 pounds	1·95 pounds	2·05 pounds
North Dakota ...	2·64 pounds	1·63 pounds	1·71 pounds

per shaft horse-power, thus indicating the vastly greater economy of the steam turbine and its therefore much greater superiority as a marine engine.

They carefully neglected, however, to call attention to the following comparison, which gives the measure of the relative propelling efficiencies of the two types of machinery :—

Speed.	Total pounds of water.		
	12 knots.	19 knots.	Full speed.
Delaware	83,463	243,810	422,931
North Dakota	101,883	281,784	445,979

These figures, which glaringly demonstrated the superiority of the reciprocating drive as compared to the then current turbine practice, have been maintained and even increased by the *Delaware* in service as the efficiency of the *North Dakota's* turbines rapidly decreased while at the same time the turbines became unreliable, finally necessitating her withdrawal from active service with the fleet until new machinery could be built and installed.

Destroyers of 1906.

No torpedo boats or destroyers had been appropriated for since the completion of the first lot of 16 destroyers, which had occurred in 1901-1902, these having been authorised in 1898 and having taken from three to four years for completion.

These original destroyers were of about 7,500 i.h.p. and were designed for 28·5 knots trial speed. After many difficulties and a reduction of trial speed to 27·5 knots, they were finally squeezed through and accepted. Great troubles were experienced with their light and fast-running reciprocating engines, and with their forced-draught blowers, which were also driven by reciprocating engines.

In 1906 and 1907 five more destroyers were authorised. The estimated indicated horse-power for this speed was 10,000, and the Navy Department prepared plans showing Normand reciprocating engines for this power. In advertising for bids for the construction of these vessels, bidders were invited to submit plans showing turbine machinery, both with and without cruising turbines, and were given to understand that, other things being equal, turbine installations would be preferred.

These vessels, as finally contracted for, were all of three-shaft Parsons turbine type, with a H.P. and I.P. turbine, one on each outboard shaft, for cruising purposes. The vessels were all coal burners, and while, during their construction, it was proposed to change to oil fuel, the cost of change and the difficulties in the way due to progress of construction were found to be so great that the idea was abandoned.

There never was any doubt in the mind of the Department as to the desirability of displacing the unreliable high-speed engines that had been previous practice for these light high-speed vessels by the more reliable turbine, and the step was taken with no hesitation. There was also another step in advance made at the same time, and this step was even of more value, if possible, than the adoption of steam turbines for the main propelling engines.

Steam Turbine-Driven Blowers.

One of the great sources of failure to hold high speed for any long continued period of time with all classes of vessels had been the continually recurring breakdowns of forced-draught blowers with engines of the reciprocating type. These had been done away with, and blowers driven by electric motors substituted for battleships, beginning with the *Michigan* and *South Carolina*, as already stated.

In two of these five destroyers appeared, for the first time, the turbine-driven forced-draught blower. In laying down the plans for these vessels the Bureau of Steam Engineering had scanned the market closely to find turbine-driven blowers of proper design to install for the work required. Not being able to find any such in existence, it invited in the specifications the installation of such type in place of the type directly specified. Meanwhile it succeeded in awakening the interest of the Terry Steam Turbine Company in the proposition, and by the time the contracts for the construction of the vessels were awarded, this company had developed what appeared to be, on paper at least, a very satisfactory unit.

The Cramp Ship & Engine Building Company were quick to see the advantages in this new unit and proposed its installation in the two vessels building by them. This proposal was approved and the units installed. The contractors for the remaining three vessels, however, adhered to the old reciprocating-engined blowers, arguing the greater steam cost with the small, inefficient turbines, losing sight, however, of the fact that with feed heaters installed and with turbine main engines in which excess auxiliary steam can be used in the heaters and in the low-pressure stages of the turbines, steam economy of auxiliaries only used when the main engines are in operation or used to only a small extent in port, does not cut any great figure in the general economy of the machinery plant. Also that the greater reliability of the turbine blowers would, if realised, more than offset any possible loss in economy, as the forced-draught blowers, in rate of importance to a destroyer, are as necessary as a good heart is to the human body.

The blower units as fitted were of the vertical, direct-connected turbine type, with single-stage Terry turbines driving what are known as multivane fans of the Sirocco type. These fans are located directly at the base of the intake ventilators and discharge throughout their complete circumference into what is called a diffuser chamber, in which the velocity of the discharge becomes reduced and the air pressure after discharge from the fans increased.

The diffusion chamber is formed by two plates forming frustums of cones with the bases separated several inches at the outer circumference; the inner edges of the plates at the fans being separated to the width of the fan blades.

When the vessels carrying the new type of blowers were tried great trouble was experienced due to two fans discharging into the same fire-room; unless the fans were running at practically the same speeds, that fan which was doing the least work would be wrecked on account of the air being forced back through it. After considerable trouble and experiment the cause of the trouble was located. It was due to the too great width of discharge opening from the diffuser chamber. This error was corrected and the fans

by their later performances installed such confidence that no other type of blower than that of the turbine driven has since been considered for destroyer work, and in later vessels of other types it has even shouldered the electric-driven fan out of the way, as the flexibility of control is so much greater.

Experience with Oil Fuel on the "Delaware" and "North Dakota."

The oil-fuel handling of these two vessels varied in one respect, and that was in the location of the settling tanks, that of the *Delaware* being located aft alongside the engine-room, while the *North Dakota* followed the Bureau plans and had a small cylindrical tank located in the upper part of each fire-room. This location on the *North Dakota* was later credited with a disastrous fire on that vessel in which several lives were lost. The real cause of the disaster was, however, the fact that each of these tanks was fitted with a glass gauge for indicating the height of oil in the tank, and oil vapour having collected on the flat top of the B. & W. boilers, it became ignited in some unknown manner, the flash resulting broke the gauge glass and, the booster pump supplying oil to the tank being running at the time, the oil was forced out and burned like a gigantic torch until the pump was stopped and the tank completely emptied.

Orders were immediately issued by the Department prohibiting the use of gauge glasses on oil-fuel tanks unless such glasses were fitted with spring valves that were open only while readings were being taken, the valves closing automatically when released.

Other troubles were experienced with the oil fuel due to the inexperience of all hands concerned with it, including the makers of the oil-fuel apparatus. The burners as originally supplied were of sufficient capacity to deliver the full power condition, and this, on account of insufficient volume of furnace above the grates, resulted in heavy carbonisation on the grates and bridge walls and in very heavy smoke formation. All manner of criticism was levelled at the system employed, and it was only by taking a strong stand on the subject that the Bureau prevented it from being superseded by air or steam atomisation. The succeeding years have demonstrated the wisdom of the step and we hear no more of propositions to use any other system.

1907-1908.

The next naval appropriation bill provided for two battleships of the Dreadnought type and for ten destroyers.

The battleships, later named the *Florida* and *Utah*, were very similar to the *Delaware* in hull lines, but of about 1,000 tons greater displacement, requiring a slightly greater tow-rope power at low speeds and slightly lower tow-rope power at 21 knots than was required for the previous vessels.

In laying down the machinery arrangement plans, the fire-room arrangement of boilers and piping was practically duplicated, the boilers, however, being slightly increased in heating surface over the total heating and superheating surface of the earlier vessels, while no superheaters were installed, the Parsons marine turbine not being adapted to use superheated steam on account of the abnormally small radial blade clearances which must be provided in that turbine in the high-pressure stages in order to preserve, or rather realise, a good efficiency.

Following the British lead, the engine-rooms were laid out showing a four-shaft installation of Parsons turbines with H.P. turbines, both ahead and astern, on the outboard shafts, and L.P. ahead and astern turbines on the inboard shafts. The inboard shafts likewise carried cruising turbines, a H.P. turbine on one and an I.P. turbine on the other, so that at low speeds the steam would just pass through the H.P. cruising, then the I.P. cruising, thence to both H.P. mains, finally through both L.P.'s to the condensers. At intermediate speeds it was admitted to the I.P. cruising direct, the H.P. cruising running in vacuo. At higher speeds both cruising turbines were cut out and ran in vacuo.

Necessity for Cruising Economy in our Battleships.

When the conditions under which our battleships must operate are compared with those which faced European nations in the period directly preceding the present great war, a war which they all evidently had in mind in the preparation of the machinery designs for their vessels, it is readily understood why they could afford to neglect any provisions for insuring great cruising radius, while with us the necessity for providing the maximum cruising radius is imperative.

The former nations were providing for operations in confined waters such as the North Sea and the Mediterranean, where they were never far from their bases. The runs from base to station were short, and occasion might arise where these runs would have to be made at high speed. Re-fuelling became a simple proposition. Under the conditions foreseen high speed was more desirable than cruising radius, and the latter was sacrificed.

Turning now to the conditions confronting us, we see the entire western half of the North Atlantic ocean from the northern shores of South America to Greenland on our Eastern sea front, and the entire line from Seattle to Panama to the southward, and from Seattle to Honolulu, thence to Guam and on to the Philippines and still further to Samoa, requiring our attention. The areas to be covered are great and the distances to bases and from base to base in some cases are magnificent. Fuel economy is of the highest value, even predominates over high speed, as the re-fuelling problem becomes a serious one, and the greater our bunker capacities and the greater the fuel economy of our machinery, by so much is the seriousness of the problem reduced.

It will be shown later how this question had an important bearing on the decision of the Department as to the types of machinery to be fitted in some of our subsequent vessels.

Beyond the installation of Parsons turbines in these two vessels the only point of practical engineering interest was a change in the basis of design of feed heaters. The old empirical rule used for years in the design had been to allow one square foot of heating surface for every ten designed indicated horse-power. Such a rule took no account of the amount of heating medium, which in the case of naval vessels is the auxiliary exhaust steam, the temperature of the heating medium, nor of the amount of feed water to be heated. During the year preceding the designing of these vessels the Bureau of Steam Engineering had developed a feed heater which, when constructed, had been thoroughly tested out at the engineering experiment station under conditions of exhaust pressure and temperature corresponding to those used in service. From the results of these tests design curves were prepared, and from these curves the necessary surface for the feed heaters was obtained.

In connection with these tests comparative tests were made with and without whirler strips in the tubes, these whirler strips being nothing but ribbons of sheet copper twisted to a pitch of 6 in. and inserted in the tubes, extending their full length. These whirlers, by causing every particle of water flowing through the tube to be brought into intimate contact with the heating surface, increased the efficiency of the heater about 25 per cent.

The heaters developed from the design curves required a total heating surface for both heaters, inclusive, of 700 sq. ft., while those of the preceding vessels, under the old empirical rules, required 2,100 sq. ft.

In service the new heaters, paradoxical as it may seem, have done much better work than the old ones, delivering the feed at considerably higher temperatures and eliminating the constant trouble of leaky joints that had formerly been experienced.

I am giving the above as an illustration of the beneficial results that may be expected, both in small and in large problems, by carrying out a series of well thought out experiments, and am happy to be able to say that this is only one of the many instances where the engineering experiment station has demonstrated its value to the Bureau of Steam Engineering and through it to the naval service in general.

GENERAL NEWS SECTION.

PERSONAL.

Admiralty Changes.

The Secretary of the Admiralty has announced that the King has approved the following changes in the Board of Admiralty :—

Vice-Admiral Sir Rosslyn E. Wemyss, K.C.B., C.M.G., M.V.O., to be Second Sea Lord, in succession to Admiral Sir Cecil Burney, G.C.M.G., K.C.B., who will be employed on special duty.

Mr. Alan Garrett Anderson (late Vice-Chairman of the Wheat Commission) to be Controller in the vacancy created by the appointment of the Right Hon. Sir Eric C. Geddes, K.C.B., M.P., as First Lord of the Admiralty.

It is also announced that Mr. R. F. Dunnell (Secretary and Solicitor of the North-Eastern Railway) has, with the approval of the directors of the North-Eastern Railway, accepted the appointment of Temporary and Additional Assistant Secretary of the Admiralty.

It is further announced that Sir W. Graham Greene, K.C.B., has been invited by the Minister of Munitions to undertake the duties of Secretary of the Ministry. Sir Graham Greene, with the Prime Minister's approval, has accepted this invitation, and has vacated the office of Permanent Secretary of the Admiralty. An announcement as to his successor will be made later. In the meantime, Sir Oswyn Murray, K.C.B., will act as Secretary.

The death is announced of Mr. Hugh Cuthbert, in his 91st year, formerly a well-known shipowner in Greenock, where he carried on business with the late Mr. A. O. Leitch and others. For a good many years Mr. Cuthbert had been resident in Edinburgh.

Mr. Peter Youngson, B.Sc. (London), has been provisionally appointed Lecturer in Marine Engineering at the new school for the education of marine engineers which is to be opened this autumn by the Liverpool Education Authority. The new principal is at the present time Lecturer in Marine Engineering at the Robert Gordon's Technical College, Aberdeen, and before that was a teacher at the South Shields Marine Engineering School from 1903 to 1914.

The death recently occurred at Southampton of the Rev. J. K. Mellis, who, before his retirement a few years ago, was for 25 years Chaplain to the Missions to Seamen for a district which took in Southampton and the adjacent waters as far as Poole and the port of Havre. He was ordained in 1860, and subsequently worked for 10 years as Chaplain to the Missions to Seamen at Cardiff, but, owing to a breakdown in health, became Vicar of Llanarth (Mon.) for five years ; but subsequently he returned to the Missions to Seamen and spent the remainder of his life at Southampton, where he was one of the best-known figures. He was one of the senior Chaplains in the service, and known to seafaring people all over the world.

Mr. Thomas W. Cherry has been appointed sole representative for Cammell Laird & Co., Ltd., Sheffield, in the North-East Coast district, which position was previously held by the late Mr. Joseph Johnson. Mr. Cherry, in 1887, entered the St. Peter's Works of R. & W. Hawthorn, Leslie & Co., Ltd., and after serving five years' apprenticeship in their shops, remained for a number of years in their drawing offices under Mr. James M. Allan, now Managing Director of Cammell Laird & Co., Ltd., at their Sheffield and Penistone Works. He was then appointed Assistant Works Manager to Scotts' Shipbuilding & Engineering Company, Ltd., of Greenock, and remained with them a number of years. For the past few years he has been with John Rogerson & Co., Ltd., of Wolsingham, as Outside Manager and Representative on the North-East Coast.

Mr. Wm. Browne, Master Mariner, of Cardiff, who died on June 9, left estate of the gross value of £1,540.

Lieutenant Clifford Jones, a partner of the Cardiff shipowning firm of Mordey, Jones & Co., has been promoted to the rank of full Lieutenant.

Mr. William John Dott, Manager of the Allan Line, whose death occurred on June 2 last, left estate valued at £5,269, with net personalty £4,489.

Lieutenant Charles W. Ballard has been awarded the Military Cross. At the outbreak of the war Lieutenant Ballard was Deputy-Superintendent at the Board of Trade Office, Cardiff Docks.

Mr. T. H. Catcheside, of the North of England Steamship Owners' Association, has been appointed upon a local Advisory Wages Board, established by the Ministry of Labour in connection with the civil employment of disabled soldiers and sailors.

Mr. A. Souter, third officer of the steamship *Morinier*, of London, has been awarded a silver medal and diploma by the President of the French Republic in recognition of his services in rescuing a French seaman at St. Nazaire on October 27, 1916.

Mr. Sam Bunton, who has been Secretary of the Glasgow District Council of the Amalgamated Society of Engineers for the past five years, took up his new duties last week in connection with the Shipyard Labour Committee to the Admiralty. Mr. William Kerr has been appointed *interim* Secretary of the District Council.

Mr. L. E. Smith, of Smith's Dock Company, and Mr. M. C. James, Mercantile Dry Dock Company, Jarrow, have been appointed local superintendents for the North-East Coast district to assist in carrying out the Controller's scheme for dealing with ship repair work Their local offices are at Bolbec Hall, Westgate Road, Newcastle.

Mr. John James Evans, one of the Government nominee members of the Mersey Docks and Harbour Board, has just died suddenly in his 76th year. He was also a member of the Wallasey Embankment Commission, and only a year ago retired from business as Chairman of Evans, Sons, Lescher & Webb, of Liverpool and London.

Captain W. R. Smith (of W. R. Smith & Sons,' shipowners, Cardiff) has given 1,000 guineas to the King Edward VII's Hospital, Cardiff. A sum of £450 has also been given to maintain six beds at the Welsh Hospital, Netley. These beds are endowed by W. R. Smith & Sons in appreciation of the services of their clerical staff and the members of the crews of their steamers during the war.

Mr. James Gavin, General Secretary of the Amalgamated Society of Steel and Iron Workers of Great Britain, resigned the Secretaryship last week. He had been General Secretary of the Society for nearly 15 years. During his term of office, Mr. Gavin has acted as Joint Secretary of the Pig Iron Wages Board and of the Board of Conciliation and Arbitration for the Manufactured Iron Trade of Scotland. He also acted as Joint Secretary of the Board of Conciliation and Arbitration for the Steel Trade in the West of Scotland, the oldest conciliation board in Scotland. Mr. Gavin is one of the few remaining members of the conference of employers

and workmen which met in Glasgow in 1890, at which it was decided to form the Board. Since that time the Board has been most successful in preventing strikes in the steel trade on account of the automatic arrangement for the regulation of wages.

FROM OUR CORRESPONDENTS.

CLYDE AND DISTRICT.

(From Our Own Correspondent.)

Glasgow.

A steady improvement has taken place in the trade of Greenock since the reconstitution of the harbour authority in 1913. The Harbour Trustees elected in that year under the reconstruction scheme set about improving the facilities of the port and extending its trade in various directions. So successful have they been in this work, that instead of showing a debit balance as formerly, the accounts have shown a fairly substantial credit balance for several years past. At a meeting of the Harbour Trustees last week it was reported that the surplus of income over revenue for the 12 months ended June 30 last amounted to over £11,000. This is considered a very satisfactory balance in view of the fact that the oncost charges such as wages, coal and other items have greatly increased owing to the war, and there has also been a loss of revenue owing to the withdrawal of several of the river, coasting, and cross-channel services.

Coal Export Trade.

Owing to the scarcity of tonnage and other conditions arising out of the war the shipment of coal from Scottish ports shows a considerable falling off during the seven months of the year, which have now passed, compared with the corresponding period of last year, and of course a much greater falling off when compared with pre-war times. The decline in the export of coal from all the Scottish ports up to date is almost two million tons compared with the output for the first seven months of last year. In this temporary falling off in trade the Fife and Lothian ports including Leith, Methil and Burntisland, have suffered most, as the exports from these places before the war were sent for most part to Norway, Sweden and Germany. The decline in exports from the East Coast of Scotland amounts to nearly one and a half million tons, while from the Clyde ports the falling off approximates to half a million tons. It is anticipated that some considerable readjustments may be made in the coastwise shipment of coals as a result of the Coal Controller's Transport Order which comes into operation next month.

A Shipbuilding Town's Water Supply.

The importance of an adequate water supply to a shipbuilding community was strongly brought out at an inquiry which was conducted in Glasgow last week before a Government Commission. Port Glasgow Town Council have promoted a Provisional Order in terms of which power is asked from Parliament to enlarge the existing water supply. The scheme was opposed by one of the proprietors of the land from which the additional supply is to be drawn. In view of the extension of the shipbuilding industry in Port Glasgow, and the pressing need which exists for a greater water supply, it is proposed to proceed immediately with a part of the scheme and to delay the remainder till after the war. As showing the urgency of increasing the water supply, Provost Macfarlane, of Port Glasgow, mentioned that following the dry summer of 1914 they had to curtail consumption by limiting the supply to six hours per day for a month. During the period the water was cut off a big fire broke out in one of the shipyards, and serious loss of property ensued. At the close of inquiry the Commissioners found the preamble of the Order proved, and the clauses were afterwards adjusted in a manner satisfactory to the promoters.

Aberdeen Shipyard Improvements.

In addition to a new shipyard being laid out at Aberdeen, it is understood that improvements and extensions are being made on existing yards at the port, so that when the industry returns to its normal condition after the war it is probable that the annual output of new tonnage will be much larger than it was prior to the outbreak of hostilities. At a recent meeting of Aberdeen Harbour Board permission was granted to the John Duthie Torry Shipbuilding Company to lay down two additional launching ways, one of the conditions being that the firm pay an annual charge of £75 in order to compensate for any loss that may be caused to the salmon fishing in the vicinity. The work of constructing the ways will be undertaken at an early date.

NORTH-EAST COAST.

(From Our Own Correspondent.)

Newcastle.

The third anniversary of England's entry into the war was commemorated by Newcastle business men in a spirit of resolution and optimism. On the floor of the Quayside Exchange the members of the Commercial Exchange and the Local Chamber of Commerce held a joint meeting, when the Lord Mayor (Mr. George Lunn) in a vigorous speech emphasised the national demand for guarantees for future security and for political and economical development. In the metaphor of the football field, his lordship said the Kaiser rushed on the field, and kicked off before the whistle blew, electing to play down hill and rushed the goal. He had violated all the rules of the game, and every day there were numerous fouls and dirty play. He tried to hack his way through and now he was appealing to the referee to blow the whistle and call a draw. We must keep fighting, and allow the army and the navy to take the penalty kick and secure the victory—a sentiment that was heartily applauded by everyone in the large company present.

Wages After the War.

It is now a certainty that when the war is over wages questions will loom even larger in the public eye than they have done in the period of the war. A very important decision was announced in the past week regarding the war bonuses paid to railway men. The Railway Central Committee for the Workers and the Government Committee in control of the railways have come to an agreement that the war bonus of 15s. a week now being paid to railway workers shall be merged in wages. This means that the bonus becomes an integral part of the men's weekly earnings, and it is quite natural to assume that the rest of the trade unions, including those in the ship building and engineering industries, will put forward a claim that present wages shall rule after the war is over. This may, therefore, put quite a new complexion on post-war economic conditions. The cost of living has been the primary argument by the trade unions when seeking successive increase in wages, and as the cost of commodities has gone up in a great ratio than real wages have advanced, the workers are sure to make a determined effort to maintain the present high rate of earnings. It is now clearly shown that the keeping down of the prices of foodstuff would have been a much better remedy for the abnormal conditions than in periodically raising the wages bill, for when the war is over employers will be faced with such a high cost of production that it may, nay, is sure, to place them in a difficult position when competing with their rivals abroad.

Transport Workers' Wages.

On behalf of the transport workers employed by timber merchants and importers on the Tyne and Wear and at Blyth, the official delegates of the National Amalgamated Union of Labour have forwarded to the employers an application for an increase in wages. It has been pointed out that the wages of many of the members for whom an advance is sought are low, and especially having regard to the high cost of living. The men's union is now gathering data from other parts in the matter of earnings made by men of this class, and subsequently the employers will be asked to receive a deputation.

Sea Apprentices' Training.

War conditions are tending to delay sea apprentices in the completion of their training previous to sitting for a Board of Trade certificate, and at the last meeting of the North of England Steamship Owners' Association attention was drawn to the matter by Mr. Daniel Stephens, who pointed out the hardship suffered by apprentices on board ship which had been in harbour for considerable periods, and also by those who were compelled to remain ashore through the loss of their vessel. Mr. Stephens remarked on the fact that the sitting for a second mate's certificate involved proof of service of four-fifths of their indentured time at sea and that this condition was almost impossible of fulfilment in the present circumstances. The members of the Association were sympathetic to the views of Mr. Stephens, and a small committee was appointed, comprising himself Mr. M. M. Mein and the secretary (Captain W. R. Lord) to negotiate with the Board of Trade to see if some modification could be obtained in respect of the regulations relating to seagoing apprentices.

New Shipyard on the Wear.

The ground which years ago was utilised by the late Mr. W. Oswald, at Pallion, on the Wear, has been acquired by a newly formed firm

of which Sir John Ellerman, the well-known shipowner, is understood to be the principal partner, while others interested are said to include Sir William Gray & Co., the West Hartlepool shipbuilders. The ground has not been used for a long while, but it is very suitable for the purposes which the new enterprise has in view. It covers an area of about 16 acres and there is accommodation for four berths, the largest of which could take a vessel six hundred feet long. There are good railway sidings close by, and the launching space is quite convenient for an establishment of this size. When the shipyard is in full swing the yard will employ 3,000 men.

MERSEY SHIPPING AND SHIPBUILDING.

(From Our Own Correspondent.)

Liverpool.

It is calculated by business men here that the new Commercial Reference Library opened on Wednesday by Lord Parmoor, in the Exchange Buildings, will be of the utmost value in the development of the trade and commerce of the port. It is very centrally situated and can be entered from three sides of the business area surrounding it. The main room is 74 ft. long by 40 ft. wide, and this contains the latest directories, year-books, atlases, maps, encyclopædias, dictionaries (English, foreign and technical), books on all commercial subjects, on the production of countries, commercial law, and all Government publications dealing with commerce. There will also be a large selection of trade journals and periodicals. In addition to a staff which will be skilled in the work of indexing and making the contents of these books, &c., quickly available, arrangements have been made for associating with the library a number of men willing to act as translators for the French, Spanish, Italian, German, Russian and Portuguese languages. It is also intended to compile and keep up to date an index of commodities with the names of all the local firms importing or exporting such goods. It is also intended to form a collection of trade catalogues.

H.M. School-Ship "Conway."

In presenting the King's Gold Medal to Cadet N. H. Bowyer, and other prizes to the successful cadets on board H.M. School-ship *Conway* last week, Mr. G. D. Killey, the chairman of the Management Committee, observed that at the present time no less than 1,030 old Conways were serving in the fighting forces of the country. Eighty had been killed, either on shore or afloat. The undying and indomitable spirit of the men of the Merchant Service, whether it was on the bridge or in the forecastle, had won the admiration of the whole world, and he was glad to record that old *Conway* boys had received such a number of extremely high distinctions, including 1 V.C., 1 K.C.M.G., 2 C.M.G.'s, 13 D.S.O.'s, 12 D.S.C.'s, 4 M.C.'s, 1 M.M., 1 Albert Medal, 5 foreign decorations, and a large number mentioned in despatches.

Manchester Ship Canal Charges.

A further increase in the Manchester Ship Canal Company's rates and charges came into force on Monday this week. A 15 per cent. addition was made in the ship canal toll, and wharfage on merchandise and minerals, on ship dues, and on the use of ship canal tugs. The rates for discharging and loading vessels, and for quay porterage, warehousing and storing in the open, were also advanced by 10 per cent.

Industrial Unrest.

In the report of the Commissioners appointed to inquire into Industrial Unrest it is interesting to read that "generally speaking, harmonious relations existed between the employers of the Port of Liverpool and the men employed by them, and that they were very ready to meet each other and discuss differences and troubles as they arose, or even before they arose, the employers being ready to meet the accredited members of the different trade unions as ambassadors of the men, and both parties were inclined to lay the blame for such unrest as exists upon the Departmental control which war conditions have rendered necessary."

Invaluable Assistance.

Reference is made in the annual report of the British Cotton Growing Association to the invaluable assistance which Elder, Dempster & Co., Ltd., have given the Association in transporting to this country the raw cotton grown in the West African colonies. They are credited with having done everything possible under very difficult circumstances to maintain regular services.

SOUTH WALES NOTES.

(From Our Own Correspondent.)

Cardiff.

The Board of Trade, it is reported, has been engaged for some time past in the preparation of a new scheme for the fixing of values of ships for the purposes of war risk insurances. It is stated that owners of new steamers, when applying for the fixing of values, have recently been informed that the values fixed by the owners themselves could not be accepted, and that such values would in future be determined by the conditions of the new scheme. The details of the proposed scheme have not yet been fully disclosed, but it is stated in local shipping circles that the scheme, if accepted by shipowners, will mean a large reduction in the sums at which vessels have hitherto been valued for war risk insurance. It is understood that the matter will be considered at an early meeting of the Cardiff Shipowners' Association.

Master's Certificate Suspended.

Mr. W. Anning presided at a Marine Board inquiry at the Board of Trade Offices, Cardiff, on Friday. Capt. W. H. Deane, master of the steamship *Normandiet*, pleaded guilty to a charge of being drunk on various occasions between July 10 and 16, whilst on a voyage from Swansea to Rouen. It was stated in evidence that when the vessel arrived at Rouen the French authorities had the master medically examined, with the result that he was taken ashore. The mate was placed in charge of the steamer for the homeward trip. Capt. Deane's certificate was suspended for three months.

Outward Coal Freight Rates.

The following table shows the highest rate, and the average rate, paid to representative ports last month, also the average rate for the corresponding month last year :—

	1917. Highest.	1917. Average.	1916. Average.
Cardiff to			
Barcelona	220	220	62/–
Bilbao	125	125/–	55/6
Birkenhead	12/6	12/6	9/
Gibraltar	87/6	87/6	34/5½
Nantes	61/6	61/6	41·25 fr.
Rouen	71/3	48/8½	24/7½
St. Nazaire	61/6	45/3	41·39 fr.

Compared with June, the highest rate for Barcelona shows an increase of 45s. 3d.; Bilbao, 20s.; Gibraltar, a reduction of 2s. 6d.; and Rouen, a decrease of 1s.

Port Talbot Pilotage Rates.

A request having been made by the Dock, Wharf, Riverside and General Transport Workers' Union for a by-law to be made authorising the increase of the pilotage rates at Port Talbot by 25 per cent. by way of war bonus, an inquiry was held by an inspector of the Board of Trade. The Board have now replied that they are unable to find that any sufficient justification exists in the present circumstances for them to require the Port Talbot Pilotage Board to make the by-law asked for.

Barry Pilotage Fund.

At a meeting of the Barry Pilotage Board an application was received from the pilots asking that an increase should be paid to the annuitants on the pilotage fund in consideration of the increased cost of living. The Board decided to agree to the request and to grant an increase of 40 per cent. in the annuity.

Dock Pilots' War Bonus.

The National Amalgamated Labourers' Union has applied on behalf of the dock pilots at Cardiff and Penarth for a 12½ per cent. increase in the war bonus to meet the increased cost of living. The dock pilots have since the outbreak of war had war bonuses amounting to 25 per cent.

THE FREIGHT MARKETS.

(From Our Own Correspondent.)

London.

Chartering business on the Baltic Exchange remains very limited in extent, but the tone of the market is firmly maintained. The Eastern section of the market especially is pressing for tonnage, which is hard to find. From the River Plate rates remain nominally unaltered at 145s. from the up-river ports and 140s. for down-river loading. On the North American Atlantic seaboard there

is a steady demand for tonnage on net form, this class of business being worth 200s. to the United Kingdom, 225s. to the French Bay ports and 325s. to West Italy. Gulf loading is worth 25s. to 30s. more. For heavy grain 30s. is still the quotation from the Range to the United Kingdom, and for oats the figure is 25s. Coal cargoes from Virginia to the Plate could be had at 125s. or to Rio de Janeiro at $32, but tonnage is difficult to obtain at these rates. Nitrate business is worth 202s. 6d. to Italy and sugar 250s., Cuba to France, on gross form. The Eastern section of the market is competing for available tonnage. Karachi to the United Kingdom offers 250s. on scale basis. Bombay to the United Kingdom would pay up to 275s. on deadweight and to the Mediterranean 400s. For kernels to Marseilles, 500s. is offering from the Madras coast. The rice ports are anxious to find tonnage, for which Burmah would pay 480s. to the United Kingdom and Saigon to France 500s. In the Mediterranean section of the market, ore and phosphate business is active on the basis of 45s., Huelva to the Mersey; 50s., Bougie to the Clyde; and Bilbao, 50 fr. to Boulogne. Bay business is rather slack, but 20s. has been done Bordeaux to Bristol Channel, and Bayonne to the same destination commands 22s. Salt business is worth Rs. 22, Aden to Calcutta, or 50s. from Torrevieja.

Glasgow.

The condition of the Glasgow market throughout the week has been dull and inanimate. On Monday business was suspended owing to the holiday. The demand for tonnage continues strong, but on account of the shortage of tonnage chartering is reduced to a minimum. Some business, however, was done in the outward coal trade to France and Italy at controlled rates. In the homeward markets the general tendency has been towards firmness in rates and any free tonnage had a choice of good freights. From the States 215s. was reported done for cotton, Savannah to the United Kingdom, while the general cargo rates remained firm on the basis of 200s. on net form.

Newcastle-on-Tyne.

The local freight market is in a state of chronic starvation for lack of tonnage at present, there being a serious shortage of Allied and neutral tonnage alike, with the result that very little chartering is possible. The coal trade is being very hard hit, especially so far as those collieries which are principally engaged in overseas business are concerned. Many pits are laid idle and others are working only very irregularly. A fair amount of tonnage has been taken up for the carriage of coke to French Atlantic ports at the maximum rates permissible. Coasting rates appear to have settled down to a steady 15s. for London. Tonnage for Spanish ports is in keen request, but very little is on offer. Barcelona has been done at the record rate of 215s. Vessels for Scandinavia are sorely needed, but no fixtures in that direction are reported this week.

Liverpool.

Outward chartering is very slow, but rates are fully maintained, as tonnage is still very difficult to get. The demand for coal ships has eased somewhat on account of the holidays, but it will become as acute as ever to meet existing pressing orders. Neutral tonnage is also much inquired after on time basis, and values indicate up to 60s. for suitable boats for six months' trading. In the homeward trades, business from Eastern ports is now wholly confined to boats under control, as these markets, even at the high rates ruling, fail to attract free tonnage. Values indicated are 500s. kernels, Madras Coast to Marseilles; 285s. jute, from Calcutta to Mediterranean; while rice ports are firm at 475s. to 500s. A steady business is being done at Mediterranean ore ports at full rates, and Alexandria quotes 120s. to 130s. for cotton seed to London or Hull. North America, while quiet for grain, has an active inquiry for net charters from Northern Range to the United Kingdom at 200s., to France 225s., with 30s. extra from Gulf loading. Cotton has paid 215s., Savannah to West Britain, with option to London at 235s., August-September, and these rates are still offering. Case oil has paid 150 c., New York to China, for August. River Plate, homewards, remains nominal at 145s. up-river and 140s. down-river, to the United Kingdom for neutrals.

Cardiff and Swansea.

There has been a little more activity on the market, although the fixtures reported have been mainly for French ports. There has been a heavy demand for Spanish ports at high rates, Bilbao was quoted at 125s. to 130s., while 220s. was indicated for Barcelona. Rates for the Islands were round about 75s., and for other directions have ruled unchanged. The following fixtures were reported for France:—Havre twice, at 45s. 9d. (neutral); Brest, 45s. (neutral); St. Malo, 21s. (allied) and 43s. 6d. (neutral); Cherbourg, 47s. 3d. (neutral); Caen, twice, at 48s. (neutral); Rouen, four times, at 48s. 9d. (neutral); and La Pallice, 29s. (allied). A small sailing vessel was fixed for Brest-Havre Range at 120s. Bilbao, at 130s., was the only fixture reported for Spain. There was a fairly large volume of business transacted on the Swansea market, and rates for all directions have been firmly maintained. The only dealings recorded were for France:—Caen, 46s. 6d. (neutral); Dieppe, 47s. 3d. (neutral); Rouen, twice, at 48s. 9d. (neutral) and 25s. 6d. (allied); La Pallice, 29s. (allied); and Tonnay Charente, 63s. (neutral). Port Talbot to Rouen was done at 48s. 9d. (neutral) and 25s. 3d. (allied) for a cargo of fuel.

Hull.

The market has a firm tone all round, with a good general demand for tonnage, and business is chiefly for North French destinations and West Italian ports. The demand for neutral tonnage for neutral destinations is also good, but in this section of the market chartering is quiet, as there is more difficulty in obtaining tonnage. Gas coal cargoes are a strong feature of the North French market from the Humber.

THE COAL MARKETS.

(From Our Own Correspondent.)

So far as the coal markets at the principal coal exporting ports of the country are concerned, business is decidedly sluggish. The position, indeed, is little changed compared with a fortnight or a month ago. The effect of the Coal Controller's order has been most depressing on trade, and transactions are not only limited in number, but small in extent. In many cases on the North-East coast and in South Wales the pits are idle or working short time, in order to prevent the accumulation of stocks, which are still greater than the demand warrants.

Coal of every description is plentiful, and were it not for the fact that minimum prices have been fixed, values, it is to be feared, would fall rapidly and considerably. The coal exchanges are characterised by a total lack of animation. The position holds out no immediate prospect of improvement, though it is possible the miners' holidays may have the result of steadying market conditions somewhat. A fair amount of coal continues to be taken up on contract account, but outside of this class of business there is little doing.

The bunker trade also is very dull. There is no considerable movement of shipping, and bunkers are in too plentiful supply, having regard to the restricted nature of the demand. On the North-East coast best bunkers are quoted at 24s. to 25s. and are very plentiful, while ordinaries can be had at 16s. 3d., though they are quoted up to 24s. For special bunkers the top price is 30s. At the South Wales ports bunker coal is also in plentiful supply, bests being worth 23s. and ordinaries 21s. 6d. The bunker trade is, however, slow.

The North-East coast coal markets are in an unsatisfactory condition. The fixing of prices has taken all life out of the trade, and there is no disposition on the part of operators to transact any kind of business other than for immediate needs. Colliery salesmen would like to get orders placed, but buyers do not consider that prices will rise in the immediate future, and consequently there is no rush of orders. Transactions are of a hand-to-mouth character, with supplies abundant and the pits working short time.

The Norwegian State Railways have accepted tenders for 12,000 tons of best steam coal, delivery over August and September, at a price of 30s. f.o.b. The option is given of Durham steams at 28s. 6d. to 30s.

Prices are approximately for best Blyth steams, 30s., and smalls, 20s. to 21s. 6d.; Tyne primes, 25s., and smalls, 20s. to 21s. 6d.; second steams, 25s. 6d. to 27s., and smalls, 18s. 6d.; North Northumberland steams, 28s., and smalls, 20s.; smithies, 29s. 3d. to 30s.; nuts, 24s. 6d. to 26s.; Durham gas coals, 23s. 6d. to 25s.; coking coals, 17s. to 25s.; house coal, 28s. 6d. to 30s.; best bunkers, 24s. to 25s.; ordinaries, 16s. 3d. to 24s.; and specials, 26s. 6d. to 30s.; foundry coke, 42s. 6d.; and blast furnace coke, 28s.

The South Wales coal markets are suffering from depression. There is, however, a prospect of better trade when the effect of the holiday has worn off, especially as the Admiralty demand has been large. Though the amount of new business done has been small, the tone of the market is firm in the expectation of better

times in the near future. A strike of miners affecting about 12,000 men in the South Wales coalfield has come to an end, the men having gone back to work.

It is anticipated that the movement of shipping this week will be on a larger scale and consequently the bunker coal section of the market has firmed up. Bunkers are still in very plentiful supply, but the demand is improving.

Prices are approximately for best Admiralty large steams, 33s.; seconds, 30s. 9d. to 31s. 6d.; ordinaries, 30s.; drys, 28s. 6d. to 30s.; bunkers, 21s. 6d. to 23s.; washed smalls, 24s.; best large Black Veins, 30s.; Western Valleys, 29s.; Eastern Valleys, 28s. to 29s.; nuts, 30s.; house coal, 30s. 9d. to 33s.; No. 3 Rhonddas, large, 30s. 9d., and smalls, 26s.; No. 2 Rhonddas, large, 27s., and smalls, 20s.; patent fuel, 30s.

Little new business has been done on the Hull coal market, but on contract account large quantities of coal of all descriptions continue to be taken up. A good deal of coal is going forward to France, but to neutral destinations the port business is very restricted. The authorities are taking large supplies, however, and the main industrial demand is as strong as ever. As a result there is little or no free coal on the market.

The Scottish coal markets continue dull and featureless. Shortage of tonnage remains a standing complaint, and export trade is as a consequence as poor as ever. Generally speaking, however, the home demand continues excellent for all classes of coal, especially in the West of Scotland, but trade could, with advantage to the collieries, be much brisker in the Lothians and Fife.

Prices are approximately for splints, 28s. to 30s.; Hartley's, 29s.; Ell, 26s. 6d. to 28s.; screened navigations, 28s. to 30s.; unscreened navigations, 23s. 6d. to 25s.; and steams, 27s. 6d.

The Liverpool coal market partakes of the general weakness. Steam coal is in over-abundant supply and orders would be favourably received for Lancashire, Yorkshire or Derbyshire descriptions.

As regards the Midland coal trade, there is a continuance of the brisk conditions which have prevailed for so long. The August Bank Holiday interval was welcomed by the collieries as easing the pressure which they have experienced without interruption for a considerable period, but the relief is not likely to last long. Small coals are in short supply and there is consequently a bigger demand for large steams.

The London market is on the quiet side. Merchants have been receiving supplies much more freely than was expected would be the case and have been able to supply customers' needs fairly well in addition to increasing stocks. Still, requirements are not satisfied, and with the winter approaching merchants are pressing the collieries for larger deliveries.

COMPANY REPORTS AND DIVIDENDS.

Ulster Steamship Company, Ltd.—Dividend of 5 per cent. for the past half-year.

SS. "John H. Barry."—This company, of which Headlam & Rowland, of Whitby, are managers, has paid a dividend of £50 per 1-64th share.

Scarisbrick Steamship Company, Ltd.—This company has declared an interim dividend in respect of the past half-year of 12½ per cent., less income-tax.

Helredale Steamship Company, Ltd.—This company, of which Thomas Turnbull & Son, of Whitby, are managers, has paid an interim dividend of 10 per cent.

Vickers, Ltd.—The directors announce an interim dividend of 1s. per share (5 per cent.), free of income-tax, on the ordinary shares for the six months ended June 30.

St. Just Steamship Company, Ltd.—This company (W. R. Smith & Sons, Cardiff, managers) has declared an interim dividend of 5 per cent., free of income tax.

Port of London Authority.—The accounts for the year ended March 31 last show a balance of revenue of £1,780,480, as compared with £1,710,576 for previous year. From the sum available, £985,021 has been applied to payment of interest on capital and temporary loans; £46,768 added to sinking funds; and £52,070 has been written off for depreciation on investments in respect of the general reserve and sinking funds. Of the remainder, £386,956 has been appropriated to meet expenditure on maintenance, dredging, &c., postponed in consequence of the war, £25,978 for balance of contributions to date to the newly-constituted pension fund, and £100,000 has been added to general reserve fund, leaving a balance of £310,465 to be carried forward, as compared with £232,059 for previous year. The general reserve fund, including interest, now stands at £630,824. The amount spent on capital account during the year was £164,172.

Bergsunds mek. Verkstads A/B.—This company (capital, £116,000, realised £116,000 net profit in 1916, and paid 6 per cent. dividend, besides a gratis share in the Motala Verkstads nya A/B. on each two Bergsunds shares.

Motala Verkstads nya A/B.—This company paid 10 per cent. (6 per cent.) dividend from a net profit of £32,250 (compared with £44,300 for 1915, including £31,300 profit on the sale of the Lindholm yard equipment). Including £38,600 reserves, the capital amounts to £144,000. A new debenture loan of £122,000 was undertaken in the autumn.

Schiffbau u. Kalteindustrie A.G. (Gebhardt & Konig), Nordhausen.—After claiming the war reserve fund, the accounts show a loss of £82,400. It was recommended to the general meeting on July 31 that this loss be covered by £24,500 from the special reserve fund and £57,900 from the statutory reserve, which will then amount to £23,600. Better results cannot be expected until normal conditions are restored.

Hanseatische Dampfschiffahrtsgesell., Lubeck.—The recent extraordinary general meeting accepted unanimously the proposal to raise the share capital from £14,700 to £98,000 by the issue of 1,700 bearer shares. The fresh capital is to be devoted to increasing the fleet. A number of vessels have been placed on order and some are already completed. Konsul Heinemeier (Lubeck) is elected to the superintending council in place of the late Konsul Bertling.

Lindholmens Verkstad A/B.—This company paid 14 per cent. dividend for 1916, besides a gratis share on each three old shares, thus bringing the total capital up to £110,000. During the year, there were delivered a large passenger steamer to Bergen, and four (sister) cargo-vessels of 3,100 tons each. On January 1 last, there were still under construction four more 3,100-ton cargo vessels, two 8,000-ton steamships, and two destroyers for the Swedish Navy.

Continental Rhederei A.G., Hamburg.—At the recent general meeting, 7 per cent. dividend was declared on the old shares, and 3½ per cent. on the new shares. Herr F. W. A. Dahlstrom was re-elected to the superintending council, and in his capacity as chairman of the meeting, he said that the results for 1916 were favourable, considering that part of the company's fleet was idle owing to the war. It was hoped to find work for these vessels, and the results for 1917 would then be yet more favourable.

Koln Mulheimer Dampfschiffahrts A.G.—During 1916 this company again worked at a loss. The accounts do not show if and to what extent depreciation has been allowed on the fleet and landing gear, the book value of which is given as £57,400. Working receipts last year were £13,900 and expenses £18,800. The fresh loss of £4,850 brings the total up to £9,750. The share capital (£36,700) has received no dividend for years and reorganisation of the company can hardly be delayed for long.

Forenede Dampskibsselskab, Copenhagen.—The 50th year's working of this company gave a gross profit exceeding £4,970,000, and a net profit of about £2,210,000. From this shareholders receive 35 per cent. (25 per cent.) dividend. At the end of 1916, the company's fleet amounted to 125 steamships (including 10 tugs), 72 of these vessels being written down to their scrap value; two Diesel ships; a four-masted barque; a collier; and 51 lighters, prahms, &c., making a grand total of 187,735 gross tons register.

Schiffswerft u. Maschinenfabrik Hansa A.G.—This is the new name of the Tonninger Schiffswerft u. Maschinenfabrik which was formed from the Eiderwerft A.G. in 1915, when the latter concern went into bankruptcy. The two steamships launched this year are the first to leave this yard for about eight years. Jordan & Berger Nachf. (Hamburg) and the Reederei Alek. Fahrenheim (Rostock) are interested in the present reconstruction of the company, which is now to undertake the construction of standard cargo-vessels of 2,800, 3,600, 4,500 and 6,000 tons. Fifteen such vessels (total 55,000 tons), and a 12,000-ton floating dock, are at present on order. The share capital is £85,500; mortgage liabilities, £35,600. Th. Scheld (who purchased the Eiderwerft concern) remains chief shareholder (£58,800). The first superintending council includes Fried. Fleck (Jordan & Berger); Alex. Fahrenheim; Th. Scheld (Hamburg); Dr. Gustav Goldstaub (Rostock); and Burgermeister Brandenburg (Tonning).

Aktien Gesellschaft Weser, Bremen.—Owing to suggestions that the £12,200 set aside from the 1916 receipts, for the formation of a special reserve fund, should not be deducted from the net profit before calculating the directors' shares, it has been decided to reduce the latter by £1,220 on £3,790, thus increasing the profit brought forward to current account to £11,400. The dividend remains 10 per cent. as previously recommended. Herr Christian Specht was reelected to the superintending council, and Dr. Kuster was elected as new (seventh) member.

See und Kanalschiffahrt Wm. Hemsoth A.G.—The gross profit for the past financial year amounts to £35,100 (£24,400), and the net profit, including £750 (nil) brought forward, is £1,235 (£750), which is again carried forward. The demand for tonnage last winter exceeded all expectations, but the company was unable to take full advantage thereof, partly owing to existing agreements and partly owing to the general difficulty in getting vessels loaded and unloaded promptly. The directors are unable to say anything with certainty concerning sea-shipping prospects during the present year. Warehouse business is and is likely to remain brisk.

Suddeutsche Donan Dampfschiffahrt Gesellschaft. As already announced, this company (whose shares are owned by the Austrian Government) is able to increase its dividend from 3 per cent. to 10 per cent., the net profit having risen from £6,350 to £20,250. The annual report emphasises the great dislocation and severe restriction of civil traffic which have been caused by import and export prohibitions and by military requisitioning of most of the fleet. Two boats were sunk and one badly damaged at the time of Rumania's entry into the war. The fate of six other vessels is unknown. The present book value of the fleet is £243,000. In anticipation of greatly increased traffic for some years after the war, two tugs and 18 barges have been ordered for delivery during 1917. These developments (says *Hamburger Nachrichten*) are now of considerable interest to Germany as well as Austria.

Bayerischer Lloyd, G.m.b.H. (Regensburg).—This company now pays a dividend for the first time (7½ per cent. for 1916), the balance on receipts in previous years having been carried forward. It has been decided to form the concern into a limited liability company, and to raise the original capital from £196,000 to £782,000. Of this sum, £391,000 is to be fully paid, and 25 per cent. is to be paid on the other £391,000. From the fully paid shares, £196,000 is to be paid in consideration of the transfer of the undertaking with all assets and liabilities; also, the government is to receive £111,000 in fully paid shares for the Danube fleet of the Zentral Einkaufs Gesell., Berlin. The new capital is being taken over by a syndicate under the control of the Deutschen Bank, and the present owners including the Bavarian and Imperial governments are being offered shares in proportion to their present interest, at 137½ per cent. for fully paid and 11 per cent. for 25 per cent. paid shares. The fleet of the Lloyd amounts to 115 vessels, including those now under construction.

Fougners Staal Beton Skibsbygningscompani A/S., Moss.—From £25,000 to £52,500 of the capital increase to at least £83,000 and not more than £110,000 is being offered to public subscription at par, with participation in profits for 1917. The existing yard equipment at Moss is sufficient for the annual production of reinforced concrete vessels totalling about 20,000 tons d.w. capacity. Eight vessels up to 250 tons each can be built simultaneously, in addition to two vessels up to 4,000 tons or a larger number of smaller vessels. There is also a slipway with special steel launching wagon for one vessel of 250 to 300 tons. The storage buildings for sand, gravel, cement and steel; the mixing machinery, woodworking shop and steel-bending equipment, &c., are all completed, and, with the exception of one slip, all workplaces are protected by permanent roofing. All machinery is driven electrically. An extensive adjacent site is available for the construction of large floating docks. After completing the equipment at present contemplated, the annual production will be increased by another 15,000 tons. On the existing capacity of 20,000 tons per annum the cost of the yard equipment (including the new site) is about £1 8s. 10d. per ton d.w. capacity. During the first financial period, July 1 to December 31, 1916, 15 concrete lighters were delivered or partially built and 10 per cent. dividend was paid. Besides various smaller vessels, there are at present under construction a seagoing lighter, motor driven, of 3,000 tons d.w. capacity; a floating dock; and a seagoing motor cargo vessel of 200 tons d.w. capacity. A 600-ton seagoing motor ship, 145 by 27½ by 16¾ ft., driven by a 250-h.p. motor, has been ordered by G. M. Bryde.

COMPANY REGISTRATIONS.

Isa Steamship Company, Ltd.—Capital, £2,000, in £1 shares. Objects, to acquire, build or charter ships and vessels, &c. Signatories :—

L. W. Boyd Hutchin, 47, Leadenhall Street, E.C., shipbroker.
H. H. Dennom, 22, Maplemeed Road, Wallington, shipbroker.

The first directors are to be appointed by the subscribers. Registered office, 47, Leadenhall Street, E.C. 3. Private company.

Thelma, Ltd.—Capital, £1,150, in £1 shares. Objects, to acquire the ship *Thelma*, of Aberdeen, and to trade as shipowners, &c. Signatories :—

J. Dixon Brunton, Inverisk Lodge, Musselburgh, engineer and wire manufacturer.
W. B. Kirkwood, 19, Blackford Road, Edinburgh, solicitor.

First directors, J. D. Brunton and W. B. Kirkwood. Registered office, 7, North St. David Street, Edinburgh. Private company.

Richards & Co., Ltd.—Capital, £10,000, in £1 shares. Objects, to take over the business of steam rolling contractor, iron and brass founder and marine and general engineer carried on by H. H. Richards at Newport, Mon., as "H. Richards & Co." Signatories :—

H. H. Richards, 3, Alltyryn Road, Newport, Mon., engineer.
C. A. Burpitt, 3, Chepstow Road, Newport, Mon., dental surgeon.
L. D. Williams, 24, Clyfford Crescent, Newport, Mon., bank clerk.

The first directors are H. H. Richards, C. A. Burpitt and L. D. Williams. Solicitor, S. M. T. Burpitt, 32, Stow Hill, Newport, Mon. Private company.

Sheffield Reduction Company, Ltd.—Capital, £10,000, in £1 shares. Objects, to carry on the business of thermal treaters of metals, annealers, reducers and hardeners of steel, and tool manufacturers, marine, railway, electrical and general engineers, &c. Signatories :—

A. B. Thomson, Caroline Place, Hammersmith, W.
T. Rowlands, North Church Street, Sheffield, manufacturer.

The first directors are to be appointed by the subscribers. Solicitor, S. U. Blackburn, 24, Bank Street, Sheffield. Private company.

D. Badcock, Ltd.—Capital, £75,000, in 74,000 "A" ordinary shares of £1 each and 6,000 "B" ordinary shares of 1s. each. Objects, to take over the business of barge builders, owners, letters and repairers, marine surveyors and valuers carried on at Iron Bridge Wharf, Bow Creek, Blackwall, as "D. Badcock." Signatories :—

C. A. Badcock, Iron Bridge Wharf, Blackwall, E., barge owner.
F. Badcock, Iron Bridge Wharf, Blackwall, E., barge owner.

The first directors are C. A. Badcock and F. Badcock. Registered office, Iron Bridge Wharf, Blackwall, E. Private company.

B. S. Syndicate, Ltd.—Capital, £5,000, in £10 shares. Objects, to carry on the business of salving vessels and their cargoes, and of purchasing, chartering, building and employing steam and other ships and vessels, &c. Signatories :—

Lieut. P. Westacott, R.N.V.R., 39, Victoria Street, S.W.1, C.E., &c.
T. J. Scoones, 41, Crondace Road, Parsons Green, S.W.6.

Directors :—Lieut. P. Westacott, R.N.V.R., Commander J. Bird, R.N.A.S., and C. J. Cutliffe Wright Hyne. Registered office, 39, Victoria Street, S.W.1. Private company.

Mersey Shipbuilding Company, Ltd.—Capital, £50,000, in £1 shares. Objects, Naval, marine and mercantile engineers, shipbuilders, builders of submarines and steam sailing vessels, mechanical, electrical and motor engineers, manufacturers of shipping and other machinery, tools and accessories, &c. Agreement with J. J. O'Neill. Signatories :—

J. J. O'Neill, 17, Oxford Road, Colchester, naval architect and shipbuilder.
J. Morgan, 86, Thornton Avenue, Bedford Park, Chiswick, W., financier.

The first directors are :—J. J. O'Neill (permanent managing director) and J. Morgan. Registered office, 453, Strand, W.C. Private company.

Reliance Engineering Company (Sheen), Ltd.—Capital, £1,000, in £1 shares. Objects, manufacturers of and dealers in hydroplanes, aeroplanes, marine and stationary engines, hydraulic and other pumps, &c. Signatories :—

H. W. Carter, 2, Newland Gardens, West Ealing, W., company secretary.
E. Carter, Chez Nous, Midhurst Road, West Ealing, W., dairy manager.

The first directors are: A. Starley, A. T. Creser, H. J. Owers and H. W. Carter. Registered office: 339A, Upper Richmond Road, East Sheen, Surrey. Private company.

NEWS PARAGRAPHS.

Trieste Freie Schiffahrt A.G. It is proposed to raise the capital of this company from £116,000 to £666,000.

Vereenigde Stoom-en-Zeilvisschary. A new fishery company with this title has been founded in Scheveningen, with £83,333 capital.

Scheepsexploitatie Maatschappy Bestevaer.—This firm of shipowners has been founded in Ymuiden with a fully paid share capital of £41,670.

French Shipping Losses. The returns of shipping losses and accidents for 1916 issued by the Bureau Veritas, gives a total of 2,770,319 gross tonnage merchant steamers affected, as against 502,364 gross tonnage in 1913, and an average of 600,000 gross tonnage in the four years preceding 1914.

Dutch Salvage Claim. The owners of the Ymuiden salvage fleet, which brought into harbour the German steamer *Lavinia*, have made a claim for £8,000 salvage money from the German owners. Consequently, an embargo has been laid upon the *Lavinia*. It was one of the ships which stranded in avoiding capture by the British in the affair off Bergen-aan-Zee.

Presentation for Saving a Steamer.—The Lord Mayor of Liverpool, on behalf of the Director of Transport and Shipping, presented Second-Engineer Smith with a gold watch in recognition of his services in saving a steamer, *Beech Grove*, when that vessel was drifting on a lee shore in northern waters. The whole of the firemen and donkeymen, all foreigners, deserted their posts, but Smith and one man in the stokehold maintained a full head of steam, which, the chief engineer said, prevented the destruction of the ship and crew.

Norwegian Profit and Loss.—*Norges Handals og Sjofarts Tidningen* estimates that, after allowing for war profits tax, the profits of the Norwegian mercantile marine for 1916-17 will amount to £20,700,000. The Union of Norwegian Owners estimates that up to the end of the half-year 818,988 tons of Norwegian shipping was lost by war-causes and, against 918,000 tons added by construction and purchase, there were 702,000 tons lost by marine casualties and sales, so that the net total tonnage of 2,000,000 tons is about 600,000 tons less than at the beginning of the war.

Norwegian-Russian Steamship Line.—The prospectus has been issued of the Norwegian-Russian Steamship Line Company, which has been formed to operate a service between the Baltic and the Black Sea. The head office will be in Christiania, Winge & Co. being the agents. A preliminary agreement has been arranged between the company and the Russian Steamship Company, of Petrograd, to start a joint service between Russian Baltic ports, Christiania, Bergen, Antwerp, Rotterdam, London, and the Black Sea. Each company at the start will provide two steamers, one of 3,300 tons, and one of 8,800 tons deadweight.

State Control of Shipping in France and Algeria.—The French *Journal Officiel* recently published the text of a Presidential Decree, placing the French mercantile fleet more effectively under the control of the Under Secretary of the Merchant Marine. This Decree, which revokes the Decree on the same subject of April 4, 1916, provides that from August 1, 1917, every French ship exceeding 100 tons gross register must, before clearing from a French or Algerian port, have a licence from the above-mentioned State Department approving its destination and cargo. A clause in the Decree provides that if the Government considers a proposed voyage unnecessary, in addition to refusing the permit, the vessel may be immediately requisitioned.

German Indemnity Bill for Shipping.—An Exchange message from Amsterdam states that according to the *Berliner Tageblatt* the German Government is now studying an Indemnity Bill for shipping concerns which may be submitted to the Reichstag during the coming July session. Shippers who have been informed of the contents of the Bill are dissatisfied with the meagre help which the Government is willing to give, and which is only sufficient to allow shipping concerns to resume work after the war, despite which it will be extraordinarily difficult for German shippers to compete with foreigners, who will become financially stronger owing to the war. The financial assistance by the Government cannot even attempt to indemnify shipping concerns for their losses, nor replace their reserves, which are in some cases almost completely absorbed by the war. Therefore, the possibility of German shipping competing with non-German after the war seems to be very small.

Reconstruction in Austria.—Two unions of shipowners are being formed in Austria-Hungary to deal with problems of "reconstruction," and to render unnecessary a State organisation of that nature. It is proposed to form one union of line-owners and another of tramp-owners, the two unions to work hand in hand in dealing with shipping business after the war. The primary problem will be to distribute and apply available vessels to best advantage. The unions will be represented on the central commission for war, and reconstruction economies, and it is maintained that in this way tonnage and the expert knowledge of owners will be used to best advantage. It is estimated that line owners will have about 400,000 tons d.w. capacity and tramp owners about 600,000 tons at their disposal after the war.

Dutch Marine Accident Insurance.—Representatives of the Volhardingen Seamen's Union and of the Dutch Seamen's League have conferred with the Association of Fishing Owners concerning amendments in the marine accident insurance law. The Minister of Commerce was present, and expressed the view that accident benefits could only be increased if owners paid an extra amount. A meeting of owners to consider this point was not unfavourable to paying the desired amount. The Seamen's Union now proposes that each child, if more than two are left under 16 years of age, should receive an addition of at most 10 per cent. of the daily wage, and an addition of 20 per cent. to all seamen entitled by law to disablement pension. The next of kin should receive a certain sum corresponding to the annual wage. Negotiations are still in progress.

Repatriation of Mercantile Marine Prisoners.—Over 2,000 Masters, officers and seamen of the British Mercantile Marine have been prisoners in enemy countries since the outbreak of war, when they had the misfortune to be in German ports with their vessels. The Mercantile Marine Service Association has collected and spent upwards of £10,000 in providing them with food and clothes. The recent conference at The Hague gave hope that arrangements would be completed for the release of those over 45 years of age, and the transfer of the remainder to neutral soil; but a letter has reached the secretary of the Association from the Prisoners of War Department that the agreements recently made at The Hague Conference have not yet been ratified by the German Government, and adds that the previous agreements for mutual repatriation will be resumed as soon as practicable.

Danish Prohibition Extended.—The Danish Government has extended the scope of the 1915 law prohibiting ship sale. According to the new law, no vessel belonging to a Danish owner, and no vessel being built in Denmark for a Danish owner, may be sold abroad. The latter part of this prohibition is important, because recently a number of motor-auxiliary vessels under construction in Denmark have been sold to newly-founded Norwegian owners. New vessels built in Denmark to foreign order may now be exported only with the consent of the Minister of Commerce. A number of large vessels are affected by this stipulation, but, probably, most of the vessels under construction at the time the new law came into force, will be delivered in the ordinary way. This measure has, doubtless, been brought about by the similar Norwegian law, which affected Danish orders placed with Norwegian yards. Sweden will hardly be able to avoid passing a similar law.

Reconstruction in Germany.—It is impossible to condense into a single formula all the expectations and requirements at present given publicity in Germany concerning reconstruction policy. Every shade of opinion is held from that of the advocates of State Socialism to that of the Publicists, who see salvation in the "free play of forces." The general view of many German shipowners, however, is well expressed by the following extract from a thesis by Dr. K. Isermeyer (Bremen) concerning reconstruction of German merchant shipping:—"German owners hope that the Imperial Commissioner for Reconstruction (*Ubergangswirtschaft*), Senator Dr. Sthamer, will be guided in his policy concerning shipping, by the principle of leaving the greatest possible degree of freedom to owners. Such interference as may be necessary in shipping business should be withdrawn as quickly as possible. Granted the necessary freedom, owners will master the problems of the transition period swiftly and certainly. They will also provide most easily for themselves an organisation distributing and controlling tonnage according to plan during this period. Unless they are given as much freedom as possible, further serious losses will be incurred. Owing to their

great losses during the war. German owners believe they have a special claim to unhindered development thereafter. Only thus can they rebuild their former business and engage successfully with sharp foreign competition."

Swedish Trade & Shipping Company. This company was recently founded in Stockholm with a share capital of £386,000.

J. Frerichs A.G. Schiffswerft u. Maschinenfabrik.—This company has taken over the 5,000-ton dry dock and shipyard equipment of G. A. Tayen (Brake).

New Shipbuilding Yard.—A new shipbuilding company, with Sir John Ellerman at the head, has acquired a site for a shipbuilding yard, 16 acres in extent, fitted with railway sidings, and with accommodation for four berths. When in full working order it will employ about 3,000 men.

South African Trade.—The value of the imports into the Union of South Africa during the first three months of the year was £9,270,582, as compared with £8,802,513 in the corresponding period of the previous twelve months, the exports being valued at £6,735,955 and £5,421,993 respectively.

Franz Lemm (Boitzenburg).—This Elbe shipyard (established in 1793) has now been acquired by a Hamburg syndicate and is to be enlarged considerably. Hitherto the yard has built principally vessels for inland and coastal service, but now it is to be fitted out to deal specially with motor-auxiliary vessels.

Deep-Water Wharf on the Thames.—The Port of London Authority having refused the application of the Gravesend Corporation on behalf of certain frontages for the construction of a deep-water wharf on the River Thames, the Finance Committee of the Corporation has decided to appeal to the Board of Trade.

Timber Rafts.—Sir L. C. Money in the House of Commons on August 6, informed Colonel Yate that the offer made in Norway and Sweden to send timber over to this country in specially constructed rafts so as to save shipping tonnage had been very fully considered, but it had not been found possible to accept it.

Interned Merchant Officers in Turkey.—The restrictions which were placed on the sending of parcels to prisoners of war in Turkey, having now been removed, the Imperial Merchant Service Guild War Fund Committee are again arranging for their usual parcels to be despatched at once for the Merchant Service Officers interned near Magnesia since the outbreak of the war.

Purity in Language.—The Hamburg shipping journal *Hansa* is able to devote a column to a letter from a correspondent who takes, as illustrating his complaint against the use of other than "good German words," the phrase "*hurry up tempo*," which was introduced in one of *Hansa's* articles on ship prices and accelerated construction. The offending hybrid is certainly a fine achievement!

Salving Coal Sunk 34 Years Ago.—In the year 1883 a steamship, carrying 1,200 tons of coal, was sunk near Nyborg, in the Great Belt, and such is the present scarcity of coal in Denmark that it is proposed to salve this cargo. It is hoped to recover about 1,000 tons' worth (on the spot), if the coal is in good condition, about £14,700. This coal should afford data useful in connection with the effects of under-water storage of coal, and it is to be hoped that someone may be able to acquire a few pounds of it (!) for scientific examination.

German Marine Insurance Companies.—According to *Frankfurter Zeitung*, the various German insurance companies have appointed a special committee to deal with the joint handling and sound distribution of heavy risks. It is anticipated that the number of these will be much increased by strengthened oversea traffic after the war, and by shortage or absence of foreign re-insurance facilities. An understanding has been reached with the fire insurance companies to the effect that the latter will participate in future in the larger transport risks.

German Rules for Neutral Ships.—According to a Reuter message from Copenhagen, a telegram from Berlin states that the following Imperial Order has been issued there: "As a further retaliation for the regulations made by Great Britain and her Allies with regard to the rights of maritime warfare, I lay down for the present war the following amendments to the prize regulations: Neutral ships shall be treated as enemy ships, (1) when wholly or for the greater part owned by enemy subjects or States; (2) when chartered by an enemy Government; or (3) when sailing in the interests of enemy warfare."

Chantiers et Ateliers de Saint Malo.—An important French company under this title has been formed for the construction of wooden sailing vessels of from 500 to 3,000 tons. These vessels will be fitted with Diesel motor engines, giving a speed of 8 to 10 knots. They will be constructed entirely of hard wood, and be classed "First class" for 16 years. This new dockyard has been welcomed by the authorities in France, and has already begun the building of vessels. The head office will be at 1, Place des Petits-Pères, Paris.

South African Wireless.—An Order in Council has been issued to the effect that the radio-telegraph stations on board ships, other than His Majesty's ships of war or Union Government vessels, shall not be worked whilst such ships are within a harbour of the Union of South Africa. Ships of British register must completely disconnect their aerial wires from the radio apparatus, and foreign vessels must take down the wires altogether, whilst the operating room in each case may be sealed to prevent the use of the apparatus.

South African Harbours.—According to the annual report of the General manager, the capital expenditure on harbours, lighthouses, and life-saving appliances since the establishment of the Union until December 31 last, has been £10,200,167, the net loss last year, after meeting interest charges, &c., being £39,280, as compared with £124,952 in 1915. The Administration has been working towards the gradual improvement of all the harbours, in order to keep pace with the volume of shipping, and with the increasing size and draught of vessels on the South African route.

Hollandsche Allgemeene Atlantische Scheepvaarts Mij.—The authorised capital of this company is £2,500,000, of which amount £716,666 is already paid up. In addition to the ss. *Macedonia* (6,000 tons) already in service, Dutch yards have recently completed for this firm a 600-ton and a 500-ton steamship, and a 500-ton and a 400-ton motor-auxiliary vessel. There are under construction three steamships of 6,000, 5,200 and 3,000 tons, respectively, and two motor auxiliaries of 450 and 400 tons. In addition, the firm has secured nine steamships and motor auxiliary vessels for delivery during 1917 and 1918, so that by the end of next year the fleet should comprise 19 vessels and 40,000 tons deadweight capacity.

Japan-Brazil Direct Service.—The Navigation Company recently formed in Japan to ensure a direct service to Brazil, announce the addition to their fleet of two new ships of 12,000 tons each. These vessels will be specially devoted to the transport of minerals and of food for the revictualling of Russia via Japan. The example of the Yokohama Specie Bank opening a branch at Rio will be followed by other credit institutions of Japan, with the object of supporting and developing commercial intercourse between the two nations and avoiding, with the help of the new Japanese shipping line, the necessity for the exchange of Brazilian and Japanese produce to be conducted through European and United States markets.

Canadian Steel Steamers.—Answering questions by Mr. Shirley Benn in the House of Commons on August 6, Sir L. C. Money (Parliamentary Secretary to the Shipping Controller) said that all steel steamers under construction in Canada were being built to the classification of Lloyd's or the British Corporation under the supervision of surveyors of these societies. They had been allocated to the various shipping firms of good standing for management after completion and those firms had sent out experienced superintendents to watch the progress of the work. The assistance of the technical staff of the Imperial Munitions Board was also available. Having regard to these arrangements there was, he thought, no risk of any of the ships proving unsuitable for general service whether during or after the war.

Labour Regulation (Ministry of Munitions).—Previous to the changes in the Government, Dr. Addison had invited Sir Thomas Munro, county clerk of Lanarkshire, to accept the position of Chief Director in the Labour Regulation Department of the Ministry of Munitions, to supervise the work in connection with general labour matters affecting wages and disputes, and in particular the formation of representative committees of employers and workpeople. Sir Thomas Munro has expressed his readiness to accept the invitation subject to the consent of his council being obtained and to his being relieved of other important public duties. He was a member of the Commission on the Dilution of Labour for the Clyde and Tyne districts, and is at present Labour Adviser for Scotland to the Admiralty Shipyard Labour Department and the Ministry of Munitions. He is also an assessor to the Central Board of Control (Liquor Traffic).

"SHIPBUILDING AND SHIPPING RECORD" TABLE OF SHIP SALES.

Name and Type.	Tonnage.	Dimensions. Draught in ( ).	Sold by, to	Builders, hull and year.	Machinery and builders.	Remarks.
Arachne, ss. (single dk.)	3,898 gr. 2,471 net 6,600 d.w.	360′ × 49′ × 25½′ (23′)	Rickinson, Sons & Co., West Hartlepool, to Gordon Steam Shipping Co., London	W. Gray & Co., W. Hartlepool (1912)	25, 40½, 67 × 45 (Cen. Mar. & Eng. Wks., W. Hartlepool)	—
Baron Lovat, ss.	5,604 gr. 3,582 net 9,450 d.w.	423½′ × 56′ × 28½′ (25′ 6″)	Hogarth Shipping Co., Glasgow, to British buyers	Russell & Co., Pt. Glasgow (1915)	27, 45, 74 × 51 (Rankin & Blackmore, Ltd., Greenock)	Price about £250,000.
Blake, ss. (single dk.)	3,740 gr. 2,396 net 6,375 d.w.	342′ × 46½′ × 24¾′	"Blake" SS. Co., London, to buyers not stated	W. Doxford & Sons, Sunderland (1906)	26, 42, 68 × 42 (W. Doxford & Sons)	—
Constitucion, ss. (single dk.) (ex *Zeebrugge*, ex *Arizona*)	646 gr. 385 net 890 d.w.	176′ × 29¾′ × 10½′ (11′ 6″)	Paraguayan Government, to buyers not stated	R. Thompson & Sons, Sunderland (1907)	15½, 25, 41 × 27 (Richardsons, Westgarth & Co., Middlesbrough)	Price about £45,000.
Dunachton, ss.	5,201 gr. 3,311 net	410½′ × 52¼′ × 28½′ (25′ 6″)	Dunedin SS. Co., Leith, to buyers not stated	C. Connell & Co., Ltd., Glasgow (1912)	26½, 44, 73 × 51 (Dunsmuir, Jackson, Glasgow)	—
Freshet, ss. (single dk.)	794 gr. 363 net 1,050 d.w.	1 86¼′ × 29½′ × 12½′ (14′ 1″)	E. H. Sollas, London, to T. E. Brooke, London	R. Williamson & Son, Workington (1915)	15½, 26, 44 × 30 (Richardsons, Westgarth & Co., Middlesbrough)	—
Hedwig Heidmann, ss. (single dk.)	2,084 gr. 998 net	289′ × 40½′ × 19′	H. W. Heidmann, Hamburg, to Hugo Stinnes, Mulheim	Sir Raylton Dixon & Co., Middlesbrough (1903)	20½, 34, 56 × 36 (N.E. Mar. Eng. Co., Sunderland)	—
Hikosan Maru, ss. (spar dk.) (ex *Carradale*)	3,555 gr. 2,215 net 5,360 d.w.	340½′ × 44½′ × 18¼′ (23′ 10″)	Goko Shokai, Japan, to buyers not stated	J. Laing, Sunderland (1892)	24½, 40, 66 × 45 (G. Clark, Ltd., Sunderland)	Price about £100,000, with a time charter to the end of 1917.
John Heidmann, ss. (single dk.)	2,380 gr. 1,137 net	321½′ × 42′ × 19′	H. W. Heidmann, Hamburg, to Hugo Stinnes, Mulheim	Flensburger Schiffsbaugesell., Flensburg (1896)	21¼, 35⅞, 59 × 37¾ (Flensburger Schiffsb. Gesell.)	—
Rose, ss. (single dk.) (ex *Genbert*, ex *Rose*)	872 gr. 521 net	200½′ × 32¾′ × 12¾′ (13′ 10″)	Ouse SS. Co., Goole, to British buyers	Wood, Skinner & Co., Newcastle (1894)	16, 26, 43 × 30 (N.E. Marine Eng. Co., Newcastle)	—
Rugbeian, ss. (spar dk.)	4,042 gr. 2,650 net	345′ × 48′ × 27½′ (24′ 8″)	Cambrian Steam Nav. Co., Cardiff, to British buyers	Northumberland S.B. Co., Newcastle (1904)	24½, 40, 67 × 45 (Richardsons, Westgarth & Co., Hartlepool)	Price about £90,000.
Stokesley, ss. (single dk.)	1,046 gr. 448 net 1,350 d.w.	226½′ × 32′ × 13½′ (15′ 5″)	J. J. Salvesens Rederi Akties., Norway, to buyers not stated	R. Craggs & Sons, Middlesbrough (1883)	26, 48½ × 36 (Westgarth, English & Co., Middlesbrough)	—

Hollandsche Zeeverzekering Mij., Rotterdam.—This company has been founded (with a capital of £41,666) by the Holland-Gulf Stoomvaart Mij.; the Stoomvaart Mij. Leonora; and the Nederlandsche Vrachtvaart Mij.

Vanern Sea Yards.—Now that the Vanern Sea has been made accessible to medium-sized sea-going vessels by the enlargement of the Trollhattan Canal, various shipyards there are extending their equipment in order to deal with larger vessels.

Requisitioned Ships.—A series of important questions were asked in the House of Commons on August 7 in regard to the requisitioning of ships. Sir L. Chiozza Money informed Mr. Houston that all the trades embraced in the liner requisitioning scheme had now been placed under requisition. It was true that the Government received the freight, but it had also to meet all charges other than those imposed by the blue book on the owner, and the question whether the Government made large, or indeed any, profits would depend entirely upon the rate of loss from war casualty in the future, for the Government bore the full cost of insurance against war risks. The precise terms for the arrangement for the working of requisitioned liners were in process of being finally agreed. Under this arrangement this intention was to reimburse the lines the actual cost of maintaining their organisations. If any profit eventually accrued to the Government as a result of the working of the Liner Requisitioning Scheme, it would be, of course, treated as ordinary exchequer receipts and thus benefit the British consumer indirectly. By far the greater part of our imports were now carried for Government account and therefore it was not the case that the Treasury was likely to receive large sums of money in this connection. In the course of a long series of supplementary questions Mr. Houston indicated that it was the Government and not the shipowner who was imposing the high freights. He also suggested that the capacity of the Government to receive profits in this direction would be legally tested, and pointed out the handicap that was being placed on British shipping as compared with neutrals.

PORT NOTES.

Table Bay.—The harbour has been made a compulsory piloting area, except in respect of such ships as may be exempted by statute or regulation.

Whakatane (N.Z.).—H.M. Trade Commissioner in New Zealand (Mr. R. W. Dalton) notifies that the Whakatane Harbour Board (Bay of Plenty) is spending £35,000 on works at Whakatane. It is anticipated that when the works are completed, in about two years, the depth of water will be sufficiently increased to enable boats of fairly large size to enter the port at almost any time.

Sydney (N.S.W.).—According to a report by the Canadian Government Commercial Agent at Sydney, £500,000 is to be invested in transforming Ball's Head, Sydney Harbour, into the largest bunkering depôt in the southern hemisphere. The scheme is to be a joint enterprise on the part of a United Kingdom and a New Zealand shipping company. It will bring into existence a depôt which will carry stocks of coal of 50,000 tons and upwards, as well as stores of oil fuel up to 12,000 tons. Two large jetties are to be built, giving accommodation for ships of the maximum tonnage likely to go to Sydney, with a depth of 30 ft. of water at low tide on the shore frontage and 60 ft. at the jetties.

Puerto Militar (Brazil).—According to a report by the United States Consul-General at Buenos Aires, the dry dock at Puerto Militar, near Bahia Blanca, which was commenced about ten years ago, is now completed, and has been successfully tested. The principal dimensions of the new dock are approximately as follows: Length, 600 ft. available over the bed; depth, over entrance at bottom, 32 ft.; width at entrance at base, 115 ft.; width at entrance at top, 120 ft. The basin on which the dock is situated has been dredged to a depth of 33 ft., and the outer port and entrance channel to 32 ft. Five pumps of 1,000 h.p. each are used to empty the dock, and they are able to discharge 120,000 tons of water per hour.

SHIPPING SHARE MARKET.

The stock and share markets have been inclined to dullness during the few working days since our last issue. Numerous members of the Stock Exchange took advantage of the dearth of business to absent themselves for the greater part of the week, and the attendance in the shipping share market, as with other sections, has been thinner than for some time past. The effect of the Court Line directors' circular, to which we referred last week, is still apparent on business in steamship companies' securities as a whole, although the direct effect upon Court Line shares has not proved permanent. After falling last week to 26s. 6d., the price rapidly recovered to over 30s. under the influence of strong buying orders reported to emanate chiefly from Liverpool. The strength of the company's finances was the main point which has brought about the recovery. The pessimistic view of the Government attitude which was indicated by the directors towards the steamship companies as a whole has caused a very depressed feeling in the market. In the view of leading members it would be a good thing if some of the principal shipowners could induce the Government to explain fully their probable attitude towards the companies with respect to the replacement of vessels after the war and the use of present profits for the rebuilding of steamers. The high prices which are likely to prevail for shipbuilding for some years to come will prove a deterrent to many companies to "carry on" with that vigour which the country will expect unless they have some assurance from the Government that their profits during the war are not to be confiscated by the control of their fleets at rates which cause a loss. Peninsular & Oriental and the Royal Mail issues are both lower on the balance of the week's business, as the view is taken that the mail-carrying companies are being hit unfairly in comparison with the tramp-owning lines. Shipbuilding companies' shares have been quiet, but the high yields offered by iron and steel shares continue to attract the interest of investors.

SHIPPING, SHIPBUILDING, ENGINEERING AND MARINE INSURANCE SHARE LIST.

SHIPPING.

Name.	Share and paid.	Extreme quotations, 1916.	Last ann. div. % or per share.	Yield. %	Last Quotation	Rise or Fall.
	£					
African S.S.	20	33—23½	10	6⅔	29	
Allan Line ... ... Deb.	100	—	4	4⅜	92	
Anchor Line ... Cum. pref.	10	9¾—9½	5⅜	5⅔	9½	– ¼
Do. ... ... Deb.	Stk.	105½—102½	4⅜	4⅜	102	
Argentine Nav. ... Cum. pref.	1	19/6—11/-	Nil.	Nil.	12/6	+ -/7½
Do. ... ... Deb.	Bds.	93⅛—84	6	6	99	
Australasian Un. S. Nav. Deb.	Stk.	83⅜—80½	4	5⅛	73	
Belfast Steam ... ... "A"	10 (5pd.)	—	5	5	5	
British & African Nav. Deb.	Stk.	96⅝—91	4⅜	4⅜	102	
British India Nav. ... Deb.	Stk.	94¼—88½	4½	5⅛	83	
British S.S. Invest. Trust Def.	Stk.	357—190	30*	8⅜	355	
Do. ... ... Pref.	Stk.	108—105½	6	6	101	
Do. ... ... Deb.	Stk.	79—77½	4½	6⅛	74	
Cairn Line ... ... Deb.	Bds.	99—88	5	5⅜	90⅜–91	
Do. ... ... Ord.	1	—	20†	9⅜	42 6	
Clan Line ... ... Ord.	10	32¼—22½	25	9⅜	30½	
Court Line ... ... Ord.	£1	42/—26/-	20	12	29/9	+2/9
Cunard SS. ... ... Ord.	1	101/—68/-	20*	5	77/6	–1/6
Do. ... Cum. pref.	Stk.	95—89	5	5⅝	85¼	+3¼
Do. ... ... Deb.	Stk.	99⅜—93½	4⅜	4⅝	96	
Elder Line ... ... Deb.	Stk.	97¼—89⅜	4⅜	4⅜	103	
Elder Dempster ... Cum. pref.	1	20/6—18/1½	5⅜	5⅜	19/-	
Do. ... ... Deb.	Stk.	92⅜—88⅜	5	5⅜	85	
Ellerman Lines ... Pref. Ord.	10	9¹⁵/₁₆—9½	6¼	6⅔	8¹³/₁₆	
Do. ... Guar. pref.	10	9⅛—8⅜	4⅜	5¼	8⅜	
France Fenwick ... Cum. pref.	5	98/5—92/6	5⅜	6¼	90/-	
Furness, Withy ... Ord.	1	61/3—34/3	20*	9⅓	49/3	+1/-
Do. ... Cum. pref.	10	9½—7⅜	5	6¼	8⅓	
General Steam Nav. Ord.	7½	12⅜—8¼	15	7⅜	23/-	
Do. ... ... Pref.	8	7½—6⅜	6	7⅜	16/-	
Houlder Line ... Cum. pref.	5	83/9—67/6	5⅜	7⅓	81/10½	
Do. ... ... Deb.	Stk.	—	4⅜	4⅔	93	
Houlder Bros. ... Cum. pref.	5	—	5⅜	5⅜	4	
Do. ... ... Deb.	Stk.	—	4⅜	5⅜	82	
India Gen. Nav. & Rly. ... Ord.	10	12—8⅜	6	5⅔	10⅜	
Indo-China N. ... Pref. Ord.	5	5⅞—90/-	6	6⅔	90/-	
Irrawaddy Flotilla	40	—	15	5⅛	116	
Khedivial Mail ... ... Ord.	1	37/—10/-	25	13⅓	37/-	
Do. ... ... Pref.	5	77/6—60/6	5⅜	7⅜	72/6	
Do. ... ... Deb.	Stk.	94¾—87¼	4⅜	4⅔	95	
King Line ... ... Ord.	1	—	16*	9⅜	37	
Lamport & Holt ... Cum. pref.	£1	20/9 –18/9	6	6	19/6	
Leyland (F.) ... Cum. pref.	10	8½—6¼	5	6⅜	7⅜	
Mercantile SS. ... ... Ord.	5	18⅜—12	40	13	15	
Do. ... ... Pref.	1	20/1⅛—20/-	5	6¼	16/3	
Moor Line ... ... Ord.	10	—	30	13	24⅛	
Nelson Steam Nav. ... Deb.	100	98¾—97½	5	5⅛	98¾	
New Zealand ... ... Ord.	£10	—	8	2½	32	
Do. ... ... Deb.	Stk.	90¾—88	4	4⅔	86	
Nitrate Producers SS. ... Ord.	5	25¼ –18	30	6¼	24⅜	
Do. ... Cum. pref.	5	—	5	5	5	
Oceanic Steam. Nav. ... Deb.	100	99—95⅛	4⅜	4⅔	96¾	+ ⅞
Orient.Stm.Nav.Co. Cum. pref.	10	9¾—9⅛	5	5⅔	8½	– ¼
Do. ... ... Deb.	100	98—91½	4⅜	5⅛	89	
P. & O. S. N. ... Cum. pref.	100	100—91	5	5⅜	89¾	
Do. ... ... Def.	100	349—270	18	5⅔	326	–4½
Do. ... ... Deb.	Stk	71—69	3⅜	5⅓	65⅓	
Prince Line	1	95/- –26/-	30	8⅛	86/3	
R.M.S.P. ... ... Ord.	100	134⅜—97¾	7	6½	113¼	–4¼
Do. ... ... Pref.	Stk	84½ –76⅜	5	6½	81	
Do. ... ... Deb.	Stk.	89—86	4⅜	5⅛	85	+1¼
Shaw, Savill & Alb. Cum. pref.	5	95/- –84/3	5	5⅔	81/3	
Shell Transport ... ... Ord.	1	6—4⅜	35	5⅜	5³/₁₆	
Do. ... Cum. pref.	10	10¼ –9	5	5⅜	9¼	
Sutherland SS. Co.	£1	44/6 –41/6	30	10	53/-	+ -/6
Union-Castle SS. Cum. pref.	10	7¼—7	4⅜	5	7⅜	+ ¼
Do. ... ... Deb.	Stk.	92⅜—86⅜	4	4⅔	86	
West Hartlepool ... ... Pref.	10	8¼—7½	5⅓	7⅛	7⅜	

INSURANCE.

Alliance	20 (2·4 pd.)	10½—8⅜	12 -	6⅔	13⅓	
Indem. Mutual Marine	15 (3 pd.)	13⅜—9½	15/-	5	20½	
London Assurance	25 (12½ pd.)	52½—42½	20	6	55½	- 1½
Marine Insurance	25 (15 pd.)	36⅜—33⅜	45/-	6	54¾	+ ⅜
Merchants' Marine Insurance ...	10 (2½ pd.)	7½—71/3	10	6	9⅜	– ⅛
N. British & Mercantile Ord.	25 (6¼ pd.)	34⅜ –29	40'	6⅔	35	+1
Phœnix Assurance	10 (1 pd.)	7⅜—5⅜	40	7	7⁹/₁₆	
Reliance Marine	10 (2 pd)	—	20	4½	7⅜	
Royal Exchange Assurance ..	Stk.	189½—181	10	5½	216⅜	
Sea Insurance	10 (2 pd)	19¼—19⅛	10	5⅛	29⁹/₁₆	
World Marine, Limited ...	5 (2 pd.)	61/3 –35/-	5	5	5¼	

IRON AND STEEL.

Name.	Share and paid.	Extreme quotations, 1916.	Last ann. div. % or per share.	Yield. %	Last Quotation	Rise or Fall.
	£					
Babcock & Wilcox... ... Ord.	1	64/6-47/10½	15	5	60/7½	+ -/1½
Baldwins ... Cum. pref.	1	1⅛—1	5⅜	5⅜	43/-	
Do. ... ... Deb.	Stk.	87⅛—86¼	4⅜	5⅛	84	
Bayliss, Jones ... Cum. pref.	1	—	5	7¼	1¹¹/₁₆	
Bell Bros. ... ... Cum. pref.	10	10⅜—9⅜	6	6	10	
Do. ... ... Deb.	Stk.	80—78½	5	6⅜	75½	
Bessemer (Henry) ... Ord.	1	29/—26/-	12½	12	25/3	
Bolckow Vaughan ... Ord.	1	25/10½–18/-	11	9⅛	27/-	+ /10½
Do. ... ... Cum. pref.	20	19—18	5	5⅜	16⅜	
Cargo Fleet Iron ... ... Ord.	1	23/3–13/10½	3	3⅜	21/3	- -/7½
Do. ... ... Deb.	100	86½—84	4⅜	5⅓	82	
Consett Iron Co. ... ... Ord.	1	89/4½—85/3	50	11	92/6	
Dominion Iron & Steel	Bds.	83—78	5	6⅜	79½	+1½
Dorman, Long ... ... Ord.	1	36/—22/3	14	9	38/6	+ -/4½
Do. ... ... Deb.	Stk.	97⅜—97	4	5½	73	
Ebbw Vale Steel & Iron Ord.	1	28/7⅜—19/-	12½	9⅜	26/6	
Guest, Keen & Nettefids Ord.	1	71/3 - 60/-	15*	3⅜	83/9	
Do. ... ... Cum. pref.	5	5⅛—5⅛	5	4⅜	5⅜	
Do. ... ... Deb.	Stk.	82⅜—80¼	4	5⅓	75	
Hadfield's Steel Foundry Ord.	1	82/6 69/-	30	7⅜	83/9	
Ibbotson Bros.	5 (4 pd.)	8—6	7½	4⅔	6¼	
Jessop (W.) & Sons ... Ord.	5 (4 pd.)	9 –8	15*	7¼	8⅛	
Lanarkshire Steel Cum. pref.	10	—	5	7⅛	7	
Lysaght (J.) ... Cum. pref.	1	22/7⅛—20/3	6	6	20/-	
Do. ... ... 2nd pref.	1	21/1⅜—21/-	6	6	20/-	
Manganese Bronze ... Ord.	1	—	6	11	1¹¹/₁₆	
Do. ... ... Cum. pref.	1	—	6	8	⅝	
North-Eastern Steel ... Deb.	Stk.	—	4½	–	—	
Palmers Ship & Iron "A"	1	12/6—9/-	Nil.	Nil.	9/9	
Scott (Walter) ... ... Ord.	1	26/3—17/9	15	12½	24/-	
Do. ... ... Pref.	1	16/10⅜–16/3	6	7⅜	16/3	
Sheffield Forge ... ... Ord.	1	—	15	6⅜	53/6	
Shelton Iron & Steel ... Ord.	1	20/4½ —15/-	7½	8½	20/10½	+ /10½
Do ... ... Deb.	100	91—92⅜	5	5⅔	91½	
S. Durham Steel & Iron Ord.	1	37/6—27/-	10	6⅔	33/9	
Do. ... ... Cum. pref.	1	21/—19/-	6	6½	20/-	
Do. ... ... Deb.	Stk.	82 –80	4½	5⅜	80	
Steel Co. of Scotland ... Ord.	10	—	10	10	12/1/-	
Stewarts & Lloyds Pref. ord.	10	18½ –17	10	5½	15⅜	
Do. ... ... Cum. pref.	10	—	6	4⅜	13¹³/₁₆	
Stone (J.) ... ... Cum. pref.	10	—	5	6½	8	
United States Steel ... Ord.	100$	144¾ —83¼	8	6⅔	116½	
Do. ... ... Cum. pref.	100$	128½—112⅔	7	5½	128	
Vickers Ltd. ... ... Ord.	1	40/3 - 33/6	12½	7½	39/3	+ -/3
Do. ... ... Pref.	Stk.	93—85	5	6	84	
Do. ... ... Deb.	Stk.	83 75	4	5³/₁₆	77⅜	
Weardale Steel ... Def. ord.	1	34/- 19/1½	19½	13⅜	28/9	+1/3
Do. ... ... Cum. pref.	1	23 6 –17 6	6	6	23/6	+ -/4½
Do. ... ... Deb.	Stk.	70⅜—69¼	4	6	65½	
Workington Iron & Steel Ord.	1	24/3—14/3	10	7⅜	27/-	

SHIPBUILDING AND MARINE ENGINEERING.

Armstrong, Whitworth Ord.	1	43/ —34/6	12½	7	39/6	
Do. ... ... Cum. pref.	5	75/—67/6	4	5⅔	70/4½	+ /4½
Do. ... ... Deb.	Stk.	80¼—75	5	6⅔	75/-	
Beardmore (W.) ... ... Deb.	100	99—92	4½	5	91/-	
Brown (John) ... ... Ord.	1 (15s. pd.)	27/3 - 20/6	12½	8⅔	25/6	
Do. ... ... Cum. pref.	10	10—5⅜	5	5⅞	8½	
Cammell Laird ... ... Ord.	5	7 –98/-	10	8	6¹³/₁₆	
Do. ... ... Cum. pref.	5	88/—76/3	5	6⅔	80/-	
Do. ... ... Deb.	100	93½—85	4½	5⅔	81	
Dunlop (Jas.) ... ... Ord.	1	19/7½-13/4½	10	10½	18/6	
Do. ... ... Cum. pref.	1	17/1½-16/4½	6	7⅛	17/6	
Fairfield Shipbldg Cum. pref.	10	8½—8⁵/₁₆	6	7½	8½xd	
Fleming & Ferguson ... Ord.	10	—	10	7	14½	
Gray (Wm.) ... ... Deb.	100	100¼—93¼	4½	4½	100¾	
Hawthorn (R. & W.) Leslie Ord.	10	15⅜—14	12½	8	15⅜	
Henderson (D. & W.) Cum. pref.	1	—	5	8⅞	⁹/₁₆	
Richardsons Westgarth Ord.	1	7/9—2/10⅜	Nil.	Nil.	6/8½	
Do. ... ... Cum. pref	1	15/7½—8/-	Nil.	Nil.	13/6	
Do. ... ... Deb.	Stk.	69—67¼	4½	6¼	62	
Simons (W.) ... Cum. pref.	10	—	5	5	9¹⁵/₁₆	
Swan, Hunter & W. R. ... Ord.	1	35/6—26/-	12½	7	39/-	
Do. ... ... Cum. pref.	1	18/9—17/-	5	5⅞	17/6	
Do. ... ... Deb.	Stk.	82—80½	4¼	5⅜	78	
Thornycroft (John I.) ... Ord.	1	33/9—21/9	17½	9¼	3⁸/-	
Do. ... ... Cum. pref	1	18/6—16/3	6	6⅜	16/9	
Do. ... ... Deb.	100	95½—38	5	5⅔	86½	
Wallsend Slipway ... Ord.	1	2 –1⅛	10	5	2	
Do. ... ... Cum. pref.	1	1 –1	5	5	1	

* Including bonus.

† Also 20 % in shares.

Best Quality Galvanized Plough Steel Wire Rope, 10½ in. Circ.

NEWALL'S
Steel Wire Ropes

Extra Special Flexible Steel Wire Ropes for use on Giant Cranes, etc., in Shipyards and Engineering Works.

Special Ropes for use on board Warships and for Aeroplanes and Ordnance. :: ::

R.S. NEWALL & SON, LTD.

LIVERPOOL
GLASGOW
LONDON

LIFE-SAVING AT SEA :: BOAT LAUNCHING REFORM.

Maximum of Speed and Safety in Boat Launching attained by fitting

GRAHAM'S PATENT SINGLE DAVIT

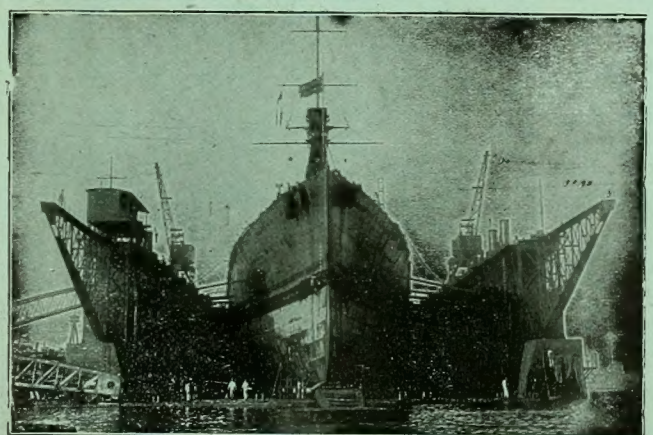
In use on Ocean Liners.

Having Mechanical Slewing and Lowering Gear.
Single Suspension. : : : : Central Slinging.
Single Automatic Detaching Hook.

Saving in Weight, Space and Upkeep.

Full particulars from Proprietors:—

JAMES HOWDEN & CO., LTD., SCOTLAND ST., GLASGOW.



BRIGGS' BITUMINOUS COATINGS

HAVE BEEN APPLIED TO

THE TWO LARGEST FLOATING DOCKS, THE FOUR LARGEST VESSELS, AND THE TWO BIGGEST BRIDGES

IN THE WORLD.

SPECIFY AND INSIST ON GETTING **BRIGGS'.**

THE WORLD'S RECORD ANTI-CORROSIVES.

Patentees and Sole Manufacturers:

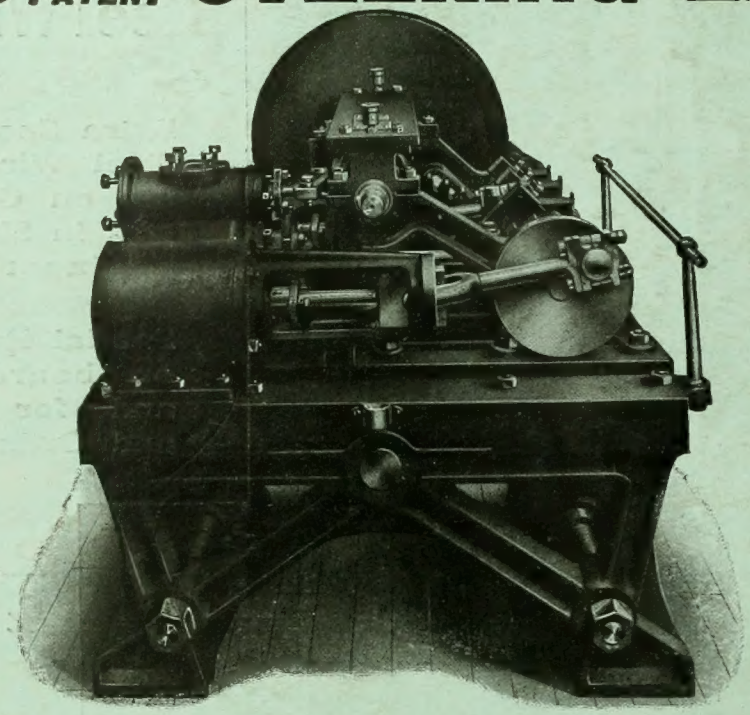
W. BRIGGS & SONS, LTD.,
DUNDEE & LONDON.

United States Agency:
BRIGGS' BITUMINOUS COMPOSITION CO., INC., 17, Battery Place, New York

THE

"MOSS" PATENT STEERING ENGINE

THE CYLINDERS ARE FIXED AND THE ORDINARY SLIDE VALVES, ECCENTRICS, AND RODS ARE DISPENSED WITH.



HAVING FEWER WORKING PARTS THE COST OF UPKEEP IS CONSIDERABLY LESS THAN ANY OTHER STEERING GEAR.

Sole Makers: HIGGINSON & CO., Engineers, Hurst Street, Liverpool.

For Emergency Lighting & Wireless.

SELF-STARTING.

The S.O.S. "LISTER-BRUSTON" Automatic Electric Generating Plant is so designed that immediately the voltage of the ship's main electrical supply falls below a predetermined point, the plant automatically starts up.

SELF-TESTING.

This plant automatically starts up and stops at any predetermined time daily, to indicate that it is in working order.

SELF-STOPPING.

Upon the resumption of the main supply the S.O.S. "LISTER-BRUSTON" Automatic Electric Generating Plant automatically stops.

For prices and further particulars apply to—

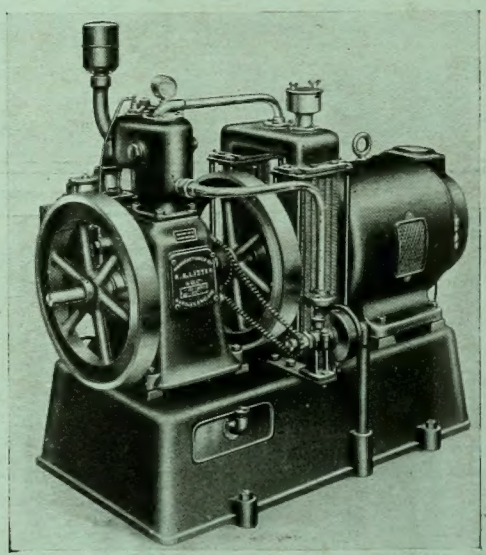
R. A. LISTER & CO., Ltd.

(Dept. B 24),

47, VICTORIA ST., WESTMINSTER, S.W.

DURSLEY, : GLOS. :

Established 1867.



The "Lister-Bruston" (Patent) Automatic Electric Generating Plant, S.O.S. Type.

London: Printed by Harrison & Sons, Printers in Ordinary to His Majesty, 45, 46, and 47, St. Martin's Lane, London, W.C. 2, and published by Transport (1910) Limited, Proprietors of Shipbuilding and Shipping Record, at Queen Anne's Chambers, Westminster, London, S.W. 1. *August* 9, 1917.